

# **The Fall of Xerox at the Turn of the Millennium: A System Dynamics Approach**

by

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A.B. Dartmouth College, 1988  
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Submitted to the System Design and Management Program  
in Partial Fulfillment of the Requirements for the Degree of

**Master of Science in Engineering and Management**

at the

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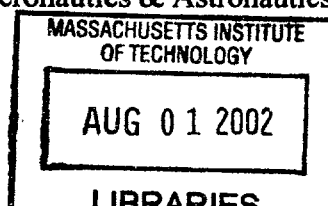
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## **Abstract**

This thesis studies some aspects of the business performance collapse of Xerox Corporation towards the end of the 1990s and the beginning of the 21<sup>st</sup> century. Utilizing the field of system dynamics as the primary modeling and analysis tool, the thesis specifically looks at three interrelated factors that an extensive public literature search, and the author's own personal experience as a Xerox employee, showed were of central importance in Xerox' decline. These factors, and their effects, were the following.

First, Xerox reorganized and consolidated its U.S. customer administration centers (CACs) from approximately three-dozen geographically distributed locations to a small handful of centralized locations. This left customers with new and unfamiliar administrative staff who were more prone to making billing errors and were less efficient in fixing them once they were discovered, thereby beginning the process of alienating customers and also forcing the sales staff to spend less time selling as they tried to fix the billing errors.

Secondly, Xerox realigned and reorganized its direct sales force from a geographic structure to one based on specific industries. This broke tremendous numbers of customer/sales representative relationships, thereby further alienating customers, since many sales reps either left Xerox (due primarily to the turmoil within Xerox) or, if they stayed, they had their territories changed. This also resulted in sales reps spending less time selling, both in the short term (due to increased new hire training, industry realignment training, and "FUD factor" churn) and in the long term (due to increased travel time).

Thirdly, especially relative to its competition, Xerox' product line began to lose appeal in the marketplace.

Ultimately, however, my analysis shows that the almost simultaneous confluence of these three factors had a nonlinear effect on Xerox' business – an effect that was worse than the sum of the three individual factors had they each occurred alone. And, since the time constants involved in these dynamics and in the overall system that is the document processing market are in many cases on the order of years, the effects on Xerox' business were significantly longer than the duration of the causal factors themselves.

## **Acknowledgments**

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At MIT I would like to thank the creators and administrators of the SDM program for having created the program in the first place – a program that perfectly fit with my career background and aspirations at the time I enrolled. And certainly I would also like to thank my advisor, Nelson Repenning, for supervising this thesis. He has provided key guidance throughout the duration of my work on it and has been extremely accommodating to the schedule under which it has been completed.

Finally, and in truth at the very top of my list, I would like to thank my entire family and certain key friends. My wife and kids, most especially, have borne the brunt of my participation in the program and completion of the thesis. There is simply no way to adequately express my thanks for and appreciation of their patience, support, encouragement, and help. In addition, however, I want to thank my extended family and friends who have not only directly supported me along the way but have also supported my wife and kids in their coping with my participation. To you all – thank you! As I am sure you are, I am looking forward to returning to a much more normal life as husband, father, and friend.

## **In Case the Reader is not Familiar with the Field of System Dynamics...**

In this thesis I have taken the approach that the reader is already familiar with the field of system dynamics and understands its terminology, symbology, and methodology. Nevertheless, I am cognizant of the fact that this may not be the case for all readers. As such, I have included in Appendix A a very brief introduction to the subject. The reader is also encouraged to explore the system dynamics references cited in this document.

## **1. Introduction**

Throughout much of the 1990s Xerox Corporation had a reputation – in the eyes of its customers, employees, people in its industry, people in the business world, and the investor community – of being a successful, growing, high-technology company that was skillfully managing its own transition to digital technology within the increasingly digital economy. However, as the technology-driven bull market of the late 1990s was in full swing, something went radically wrong with Xerox. Revenue began to flatten off and even decline, earnings estimates began to be missed regularly, and eventually losses became the norm. Market share and margins began to erode, employee morale and the stock price collapsed, and turnover – from the CEO’s suite to the product development programs to the field sales offices – began to rise. By mid-2000 rumors were appearing in the media that Xerox might be considering filing for bankruptcy.

This collapse is the central motivating factor for this thesis and, although not nearly every single causal factor for the collapse is explored, I believe the issues that are explored here do shed light on a significant portion of why it happened. *My specific intent in this thesis has been to study how just three of these causal factors interacted and contributed to Xerox’ decline and to perform this study utilizing the methodology and tools of the discipline of system dynamics.* These three factors all played themselves out in the late 1990s and were the following. First, Xerox reorganized and consolidated its U.S. customer administration centers (CACs) from approximately three-dozen geographically-distributed locations (each affiliated with Xerox’ “customer business units” – its lowest-level field entity) to a small handful of centralized locations. Secondly, it realigned and reorganized its direct sales force from a geographic structure to one based on specific industries. Thirdly, especially relative to its competition, Xerox’ product line began to lose appeal in the marketplace.

In addition to the potential inherent interest such a topic might have from the perspective of a System Design and Management program student, I have had two additional personal interests in pursuing this thesis topic. The first is that as an employee of Xerox Corporation for almost a dozen years, I have witnessed this entire unraveling from within the organization. The reasons for it, its effects on my day-to-day work life, and the company’s prospects for reversing it are all of vested interest to me as an employee and shareholder of Xerox.

My second reason for pursuing this topic is that I am academically and professionally interested in the field of system dynamics. I was first exposed to system dynamics while an undergraduate at Dartmouth College, having taken Barry Richmond’s introductory course utilizing Stella software in the late 1980s, and it was there that I developed an appreciation for the field. My Xerox career since graduation has not provided a wealth of personal opportunities to apply system dynamics (so far I have mainly functioned as a mechanical subsystem and system engineer) but I never forgot the systems thinking approach that I had learned. The System Design and Management program, and in particular this thesis, has given me the chance to become reacquainted with the field and to explore and utilize it at a much deeper level than I ever have before.

## **2. A High-Level Overview of Xerox' Product Line and Business Model**

### **2.1 Technology and Product Line**

Before embarking on a discussion of Xerox' history, the basics of Xerox' products and business should be understood. The "traditional copier" is what one typically thinks of when they think "Xerox." By "traditional" it is meant a black and white, analog (i.e. "light lens") machine which typically duplicates black and white images that are originally on cut-sheet (as opposed to web-fed) paper onto cut-sheet paper. From the time xerographic technology was first developed through today's digital age, the xerographic process has remained basically the same. The original document is either placed on or transported to a stationary position on a glass platen and bright light is flashed against it from the other side of the glass. The light from the reflection of the image is focused through lenses onto a charged photoconductive surface, typically in a drum shape or belt shape. The pattern of light and dark corresponding to the original image selectively discharges the photoconductive surface, leaving a charged latent image of the original on the surface. Small, pigmented particles of polymer, "toner," are then triboelectrically charged and electrostatically drawn to the charged areas of the photoconductive surface, forming a developed image on the surface. Paper is then brought in contact with the photoconductive surface and by creating an electric field opposite in direction to that attracting the toner to the photoconductive surface the toner is transferred to the paper. Finally, the paper with the developed image on it is typically passed through a pair of rollers that apply heat and pressure to melt the toner and fuse it to the paper, making the image permanent. The process for color xerography, which is typically done digitally (see the next paragraph), is basically the same except that it has to be repeated for four different color separations (typically cyan, magenta, yellow, and black). Depending on the architecture of the system, these repetitions may or may not result in the speed of the system being slower than that for an otherwise identical black and white system.

In a digital copier everything in the xerographic process from the photoconductive surface through the fuser is the same. The difference lies in how the image is captured and delivered to the photoconductive surface. In a digital copier light is also reflected off of the original image but instead of being channeled directly to the photoconductive surface it is instead converted into a stored electronic digital image, typically by capturing it with some kind of array of photosensitive sites which convert the level of the light into a voltage. When it comes time to put the image on the photoconductive surface typically a laser (or sometimes an array of light-emitting diodes) is used. In the more common case of a laser, the laser beam is simultaneously scanned across the photoconductive surface (by reflecting it off of a spinning, faceted mirror while the photoconductive surface moves under the laser transversely to the scanning direction) while being turned on and off so as to selectively discharge the surface. The analog to digital and digital to analog conversions of the image that are done in a digital system give rise to one of the key metrics associated with such systems – the resolution of this process which is typically expressed in spots or dots per inch (spi or dpi). Generally speaking the higher the resolution of the system (at both ends), the better the quality of the images. Early digital systems had resolutions of 300 or 400 spi but today 600 spi is the norm.

There are four significant differences between digital and analog copiers that arise out of the underlying technological differences. First, since the original image is first converted into digital, electronic format, it can be stored. This means that the original image only needs to be scanned once ("scan once, print many"), as opposed to in an analog machine in which, typically for every copy of every page made, the original must be brought to the platen glass. Secondly,



since all images (once scanned) are available arbitrarily, the internal paper path can be designed in such a way that mechanical collation of sheets for two-sided operation is instead done electronically, thus simplifying the paper path. Since paper handling is typically one of the most significant sources of unreliability in a copier, these two areas of paper handling reduction and simplification are one of the reasons digital machines, all else being equal, are typically considered more reliable than analog machines, and therefore also less expensive, both for the vendor to service and the customer to own and operate. Thirdly, since the image at one point exists in electronic form, it can be manipulated in ways that are not possible with an analog system. These manipulations can be those that improve the quality of the image (often without any intervention on the part of the user) or also those that allow the user to alter the image (and even the whole copy job itself) from what it would have been on an analog system. Finally, and perhaps most significantly, since the image is stored in electronic format, the temporal and spatial link between the image capture and image writing functions can be separated. In other words, images to be copied can be scanned at a different time and/or in a different physical location from when the copied images are actually produced. Even if all the world wanted was copying functionality, this fact enables a much different, and usually much more efficient, copying work process than that possible with analog systems. However, perhaps of even more importance, what this also means is that one now has the functionality typically called “printing” provided that one has an image in a suitable electronic format. In fact, it was Xerox that developed the first digital laser device (in the middle 1970s at its Palo Alto Research Center) and it was a printer, not a copier. The typical architecture of a digital system today is a so-called “multifunction device” in which a digital print engine is combined with either a network connection (to allow for printer functionality), a digital scanner (to provide copying functionality), or both (in which case, if equipped appropriately, the device can function not only as a printer and copier but also as a stand-alone scanner and/or fax machine).

Regardless of whether a document processing device is analog or digital, or black and white or color, there are two high-level metrics that generally are used to categorize cut-sheet document processing devices. The first, and most frequently cited, is the speed of the device, as measured in copies or prints per minute (CPM or PPM). Although the metric can apply to any size document and output sheet, the size usually assumed for standard device speed ratings is 8.5” x 11” or A4 sized sheets. Additionally, the rated speed usually refers to the maximum continuous speed of the device processing one-sided (“simplex”) documents, although depending on the architecture of the device the continuous rated speed for two-sided (“duplex”) documents can often be as high as that for one-sided documents. There are typically five subdivisions of the speed spectrum, with the thresholds between them somewhat arbitrary. At the low end, usually less than 9 PPM, are “personal” copiers and printers. Next comes the “convenience” category, usually 9 – 30 PPM, and after that the “workgroup” category from 31 to 60 PPM. Following that is the “departmental” category, typically considered to be at 61 – 119 PPM, and finally at or above 120 PPM is the “high end” or “production” category which currently ranges all the way up to 180 PPM for a number of Xerox devices.

The other high-level metric is the “duty cycle” or “volume” of the device which is a measure of the average number of prints the device produces each month (average monthly print volume, or AMPV). Manufacturers typically indicate the maximum recommended volumes for their devices, although actual use in the field varies substantially from the recommended volume, not infrequently exceeding it. Personal and convenience devices may only be rated at an AMPV of a

couple thousand whereas some production devices are rated at an AMPV of one or two million – and frequently see use at two, three, or even more times that level.

In addition to xerographic technologies, there are other technologies in use across the spectrum of the document processing device industry. At the low end (typically in the personal and convenience categories), and typically operating in color, are alternative printing technologies such as ink jet and solid ink. At the high end, often well beyond the speed range currently addressed by xerography, are various ink-based technologies, including offset lithography, many of which feed continuous webs of paper rather than cut sheets.

## 2.2 Xerox' Businesses and Business Model

Throughout most of the primary timeframe considered in this thesis, Xerox offered a range of hardware products, and associated software, for the entire spectrum of technologies and speeds mentioned above except for some of the high-end, non-xerographic technologies. Most were developed either by Xerox itself or by its Japanese joint venture with Fuji Photo Film known as Fuji Xerox, although some were sourced from original equipment manufacturers and branded as Xerox products. Xerox' low-end personal printers retailed for one or two hundred dollars, its convenience and small workgroup printers sold for several thousand dollars, typical black and white digital office multifunction devices listed for anywhere between roughly \$15,000 and \$50,000, and Xerox' high-end production machines, when outfitted with their accompanying software and also optional finishing equipment, could easily sell for \$200,000 to \$400,000 or more.

Most of the low-end products in Xerox' portfolio were sold through retail channels, value-added resellers, distributors, and sales agents acting on Xerox' behalf. However, the majority of Xerox' product line (most of the middle of the line and all of the high-end), as well as Xerox' "solutions" (more on this below), were sold by Xerox' direct sales staff. Approaching the time of the sales force reorganization that is one of the factors studied in this thesis, the Xerox direct sales staff was generally very highly respected. One analyst used the term "outstanding"<sup>1</sup> to describe it and in 1999 *Sales & Marketing Management* magazine put Xerox at #8 on its list of "America's 25 Best Sales Forces."<sup>2</sup> In the U.S. the direct sales staff numbered in the vicinity of 4,300<sup>3</sup> – 4,500<sup>4</sup> and this was out of a total U.S. field sales and support staff, including personnel handling customer administrative issues, of approximately 30,000.<sup>5</sup>

Regardless of the imaging technology employed, simplistically speaking, a key component of the business model in the industry is one of "razor blades," although, especially in the middle and high ends of the market, the "razors" provide significant revenue and profit as well. In other words, Xerox makes money not only on the initial sale of the machine (and often the software

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<sup>1</sup> Hokanson, Rudolf A. Deutsche Morgan Grenfell US Equities Research on Xerox Corporation, April 1, 1997.

<sup>2</sup> "Here's to the Winners." *Sales & Marketing Management*, July 1, 1999.

<sup>3</sup> "Xerox Shares Tumble on Word of Plan to Further Realign Sales Force." *Dow Jones Business News*, September 16, 1999.

<sup>4</sup> Same as footnote 2.

<sup>5</sup> "Xerox Splits Stock, Raises Annual Dividend." Bilovsky, Frank, *Gannett News Service*, January 24, 1996.

that drives it) but, over the course of the life of the machine in the field, also on the annuity stream it provides. This annuity stream comes from the lease of the equipment (if the ownership of the lease was maintained by Xerox as opposed to being sold to a third-party financing company), from the sale of consumables and supplies necessary to keep the machine operating (especially including toner), and service contracts on the machine. Quite frequently Xerox bundles all of these elements into a single package. Such packages usually have an up-front cost, a recurring base monthly fee, and then an additional fee on top of that that is billed monthly and is proportional to the number of prints produced above a base threshold (the so-called “click charge”). Given that the average life of a machine in the field is on the order of at least a couple of years for a low-end device and on the order of three to five or more years for a high-end device, it can readily be seen that the size of the installed base of machines is as critical an element in Xerox’ business as is the revenue generated at the time of sale. The 1998 Annual Report summarizes this fact quite clearly:

Xerox is also in the enviable position of having a solid source of recurring revenues. Of 1998’s \$19.4 billion in revenues, 62% came from service, supplies, financing and other recurring revenues. For years, our recurring revenues have accounted for more than 60 percent of total revenues. This stable source of revenues helps buffer Xerox from the economic issues in certain parts of the world, as demonstrated by our strong performance in the second half of 1998.<sup>6</sup>

In addition to this primarily hardware-based business model, Xerox is engaged in two other businesses that are also related to “the document.” The first is the business of selling “solutions.” Whereas the sale of a particular individual machine may help address a customer’s point need for copier or printer functionality, a “solution” is an attempt to address the customer’s needs from an enterprise perspective. As such, selling solutions entails understanding the customer’s industry, their particular business, the flow of knowledge and documents into, out of, and through their enterprise, and selling to them an integrated set of hardware, software, and applications that enable the customer’s enterprise document needs to be met more comprehensively. In doing this the solutions business model is one that attempts to “pull through” Xerox’ entire portfolio of products and services and grow same account revenue.<sup>7</sup> Xerox’ direct sales staff are responsible for becoming solutions sellers<sup>8</sup> in addition to their traditional roles selling “boxes.” Said President and Chief Executive Officer G. Richard Thoman:

A solutions transaction generates two to five times the amount of revenue that a traditional sale does. In traditional sales, we generate about 40 percent of the revenue from sale of the hardware itself and 60 percent from service and supplies. With an integrated solution, we also generate revenues from document

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<sup>6</sup> Allaire, Paul A. (Chairman and Chief Executive Officer) and Thoman, G. Richard (President and Chief Operating Officer). Letter to Shareholders in the Xerox Corporation 1998 Annual Report, p. 5.

<sup>7</sup> Buehler, Bill (Executive Vice President and President of Industry Solutions Operations). Internal “1999 Direction” presentation at the Leadership Communication Forum, April 21, 1999.

<sup>8</sup> Same as footnote 2.

outsourcing, software, systems integration, consulting and third-party hardware components.<sup>9</sup>

The second additional business that Xerox has had an increasing presence in is facilities management outsourcing in which Xerox manages some or all facets of a client's document processing needs. This might include managing their mail room, operating centralized printing and/or copying facilities (regardless of from which vendor(s) the hardware the client owns happens to be), and/or consulting with the client's information management staff on better ways to manage documents at the enterprise level. Even if the client does not use any Xerox equipment this is still a revenue-generating business, and it is also an opportunity for Xerox to try to increase placements of Xerox equipment and software and to drive up Xerox page volume.

The breakdown of revenues by stream provides a representative snapshot of where Xerox derived its revenues before the factors considered in this thesis began to take effect. In both 1997 and 1998, revenues from equipment sales (including some document outsourcing equipment accounted for as sales) represented 38% of total revenue. Thus non-equipment sales and other revenues in these years (specifically, revenues from supplies, paper, service, rentals, document outsourcing, and finance income) accounted for 62% of total revenues. Cut another way, in 1997 document outsourcing accounted for 11% of all revenues.<sup>10, 11</sup> Cut still another way, in 1997 all revenues were broken up as follows: services – 40.0%, equipment sales – 36.6%, consumables – 9.6%, paper and other sales – 8.2%, and financing income – 5.5%.<sup>12</sup> Note that in the latter breakdown, although not enumerated explicitly in the original source, it is my assumption from context that “services” includes document outsourcing as well as equipment servicing and rentals.

Xerox customers spanned a spectrum equally wide as its products. For most Xerox products there were really two, and sometimes three, levels of customer. First, there was the person who made the decision to *purchase* the product. In a small business office this might have been the founder or owner of the company, in a medium-sized organization this might have been a purchasing or budget center manager, and in a large organization it might have been a chief information officer. The second level of customer (and note that the first level of customer might have simultaneously fallen into this category) were the actual *users* of the product. In a typical office this would have included people in the workgroup that purchased the product whereas in a Kinko's or similar commercial graphic arts establishment it would have included the key operators actually staffing the machines. Finally, with many of Xerox' products there was a third level of customer: Xerox' customer's customer. In other words, this was the person from off the street who brought a job into Kinko's or an administrative aide in a corporate office who sent a job to their in-house central reprographic/printing facility. All of these types of customers came from a variety of industries and institutions. Many were Fortune 500 companies; some were smaller businesses; some were from specific industries such as graphic

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<sup>9</sup> Xerox Corporation 1999 Annual Report, p. 3.

<sup>10</sup> Figures in this paragraph up to this point derived from Xerox Corporation 1997 Annual Report, p. 33.

<sup>11</sup> Figures in this paragraph up to this point derived from footnote 18, p. 25.

<sup>12</sup> Derived from Weber, Stephen R. Cohen & Company Perspectives on Xerox Corporation, June 4, 1998. Figures do not add to 100% due to rounding.

arts or financial services; some were from local, state, and federal governments and their various branches; and some were from educational institutions from the elementary to the college level.

### **3. Overview of Xerox' Fall at the Turn of the Millennium**

#### **3.1 Xerox History into the Middle 1990s**

Throughout most of its 40-year history as the Xerox Corporation, and as alluded to above, the term “xerox” has been synonymous with the term “copier.” And rightly so, as Haloid, the company that would become Xerox, in the 1950s bet its entire future on the technology of “xerography” (a combination of the Greek words for “dry writing”) by developing Chester Carlson’s 1938 invention of the technology into commercially viable products. The first truly successful such product was the Model 914 launched in 1959 – the world’s first automatic plain paper copier – and it went on to become one of the most successful commercial products in history. Xerox rode this success, and that of subsequent products, to ever-increasing growth as its corporate moniker began to be used as a verb.

However, Xerox’ virtual monopoly of the copier market eventually led the Federal Trade Commission to require in 1974 that Xerox license its technology to other companies.<sup>13</sup> From then on Japanese companies in particular skillfully developed and marketed smaller, cheaper copiers than what customers were used to from Xerox and began to significantly erode Xerox’ market share. In the early and middle 1980s Xerox laid off employees and it looked at the time like the company was beyond recovery. However, through the skillful leadership of a number of key executives, the concerted efforts of the remaining workforce, and a focused institutionalization of quality principles and practices, Xerox managed to develop and market a series of products (mainly copiers) which enabled it to capture back market share. In 1989 Xerox won the Malcolm Baldrige National Quality Award.

Despite this revival, during the early and middle years of the 1990s Xerox senior management began to believe that for the company to prosper into the future it would have to make two fundamental transitions. First, it would have to become more than just a copier company and change the world’s perception of the company accordingly. Secondly, it would have to migrate its product line from being based primarily on analog technology to one based on digital technology – with a larger and larger fraction of this in color. To both publicly and internally emphasize this message in 1990 Xerox began referring to itself as “The Document Company – Xerox” – a tagline intended to convey the idea that “over the years we’ve developed a keen sense that the document is more than just a static piece of paper.”<sup>14</sup> In 1994, Xerox introduced a new logo – a large, red capital “X” in which the upper right branch of the X is drawn with a handful of square blocks (sometimes shown in different, bold colors) intended to represent digital pixels – to emphasize Xerox’ mission to become a digital company. Said Allaire at the time:

The potential for office productivity is enormous. White-collar workers represent 60 percent or more of the work force in the developed world. Documents are central to the work of these people; they spend approximately 50 percent of their time with documents. Ninety percent of information in the office today is held in the form of documents, ready for use by people. That’s why we’re focusing on

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<sup>13</sup> Xerox Corporation Profile – Hoover’s Online;  
<http://www.hoovers.com/premium/profile/7/0,2147,11657,00.html>

<sup>14</sup> Kearns, David T. (Chairman) and Allaire, Paul A. (President and Chief Executive Officer). Letter to Shareholders in the Xerox Corporation 1990 Annual Report, March 8, 1991, p. 6.

documents – in paper or electronic form – as the key leverage point for office productivity.<sup>15</sup>

It should be noted here that an additional management priority in the 1990s was to exit the insurance and financial services businesses. Xerox had entered these businesses in the 1980s<sup>16</sup> as a part of a diversification strategy but by 1992 had decided to exit them.<sup>17</sup> This exit was fully complete by 1998 and from 1995 through 1998 financial results from these operations were accounted for as discontinued operations, with continuing operations equating to the document processing business.<sup>18</sup> Whenever source data has been segregated into discontinued vs. continuing operations, only the figures reflecting performance of continuing operations (i.e. document processing) are used in this thesis.

### 3.2 Xerox from the Middle 1990s through the Turn of the Millennium

In the discussion that follows here, and in addition to the sources specifically cited in the footnotes, I have also consulted scores and scores of other references that have detailed a wide range of aspects of Xerox' recent history. As I learned more and more about all of the things that transpired within, to, and as a result of Xerox, it quickly became apparent that there simply would be no way to consider, in one thesis, all of the factors and dynamics that came into play in Xerox' recent decline. To make the thesis more tractable, I decided to choose just a subset of factors that appeared to be A) Particularly important in Xerox' decline and B) Dynamically interesting and interrelated. This criteria led me to choose the three factors cited earlier: Xerox' customer administration center consolidation, its direct sales force reorganization, and the decline of the appeal of its product line. Thus, in the remainder of this section of the document, and in fact in the rest of the thesis itself, I have selected only quotes and information that have seemed relevant to my chosen focus. The reader should be aware that there are many, many other issues involved in Xerox' decline, many of which are dynamically interrelated with the factors considered here. I have attempted to at least make mention of these other factors so that the reader is aware of the true complexity of Xerox' decline but I have not attempted to rigorously research or model these effects. With that said, on to the rest of the story...

As Xerox entered 1995 it was a \$15.1 billion company with approximately 87,600 document processing employees worldwide. 63% of revenues were from black and white copiers and 22% were from digital products.<sup>19</sup> Early in the year, in an attempt to better align field sales and service operations with its customers, Xerox decided to reorganize its field operations by eliminating the previous 65 sales districts and 77 service districts and replacing them with 37 "customer business units," each covering a geographic region and ultimately organized into three

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<sup>15</sup> Allaire, Paul A. (Chairman and Chief Executive Officer). Chairman's Message in the Xerox Corporation 1994 Annual Report, March 3, 1995, p. 3.

<sup>16</sup> Same as footnote 13.

<sup>17</sup> Allaire, Paul A. (Chairman and Chief Executive Officer). Chairman's Letter in the Xerox Corporation 1992 Annual Report, March 30, 1993, p. 2.

<sup>18</sup> Notes to Consolidated Financial Statements in the Xerox Corporation 1998 Annual Report, p. 47.

<sup>19</sup> Statistics in these two sentences from footnote 15.

broad geographic entities.<sup>20</sup> Each “CBU” consisted of all the elements necessary to conduct field operations. These included salespeople, sales specialists (specialists in particular product lines, applications, and/or industries that a “generic” sales rep would bring in as needed to help sell a product), service personnel, customer administrative people (who handled billing and related customer issues), managers, and support staff.

In 1995 overall Corporate performance, and expectations for future growth, were good enough to prompt the Board of Directors in January, 1996 to authorize a 16% increase in the annual dividend and a three-for-one stock split (to be effective in May, 1996). Despite this, and of interest in hindsight relative to the subject of this thesis, U.S. revenues in the fourth quarter of 1995 were “disappointing” according to Allaire and the company had “initiated the necessary corrective actions to return our U.S. operations to their historical effectiveness.” This comment was in reference to the aforementioned reorganization of the 30,000 people in U.S. field operations which “‘was more disruptive than we had anticipated,’ said company spokesman Judd Everhardt.” The article from which this quote was taken goes on to say “Sales people were placed in new territories, and the company changed their compensation plans, resulting in an undisclosed but ‘significant’ number of resignations, Everhardt said.”<sup>21</sup>

This 1995 sales force reorganization, which is *not* the one referenced in the introduction as being one of the three factors in Xerox’ decline studied in this thesis, is nevertheless instructive because it demonstrates how significant and long-term the effects of such a reorganization can be. Even as much as a year and a half after the reorganization was announced analysts were still citing negative effects from it as reasons for poorer-than-expected performance. For instance, in the third quarter of 1996 profit from document processing fell 2.3% and revenue from black and white copiers fell 4%, both compared to the third quarter of 1995.<sup>22</sup> The article from which these figures were taken goes on to say:

Analysts said Xerox has been spending heavily to rebuild its sales force, which suffered defections last year under a reorganization. “They lost too many of their seasoned salespeople,” said Mr. Glazer of Dean Witter [Eugene Glazer, analyst at Dean Witter Reynolds, Inc.]. With its newer, less-experienced sales force, Xerox isn’t seeing the performance it expected, he added.<sup>23</sup>

In other words, major reorganizations of field operations have the potential to negatively impact top and bottom line performance. At the very least this is because if sales people are encouraged to leave as a result of the reorganization they will be replaced by people with less experience. These people are initially less productive than their predecessors, and therefore they don’t bring in as much revenue. In addition, in an attempt to compensate for this outflow of experienced personnel, the company may very well have to spend more than it would have had to otherwise (to find, hire, and train the new sales people and to do any damage control to customer relationships and accounts in the interim), thereby eating into profits. As will be seen, this was a lesson that Xerox did not internalize nearly well enough by the time it later reorganized its field operations in 1999.

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<sup>20</sup> “Xerox Hires New VP, CIO.” King, Julia, *ComputerWorld*, February 6, 1995.

<sup>21</sup> Material in this paragraph is from footnote 5.

<sup>22</sup> “Xerox’s Weak Document-Copying Profit Raises Questions about Firm’s Recovery.” Ziegler, Bart, *The Wall Street Journal*, October 21, 1996.

<sup>23</sup> Same as footnote 22.



Despite the lingering effects of the 1995 U.S. field operations reorganization, Xerox managed to perform fairly well on an overall basis during 1996. Revenue was \$17.4 billion, up 4.8% over 1995 (up 6% on a pre-currency basis), with those derived from digital products accounting for 30% of revenues, light-lens 56%, and paper and other products 14%. Geographically, 49% of revenues were from the U.S. and 31% were from operations in the Eastern Hemisphere.

Performance and future growth prospects were again good enough for the Board of Directors to authorize an increase in the stock dividend, this time a 10% increase (effective April 1, 1997).<sup>24</sup>

1997 was a year of very strong financial performance for Xerox. It was also a year of being able to demonstrate significant progress in its transition from being a maker of stand-alone, black and white, light lens copiers to being a provider of a wide array of digital, networked, and/or color products, solutions, and services. Early in the year analysts were looking forward to the April 15<sup>th</sup> launch of the first five products in what would eventually become known as the Document Centre line of black and white digital copiers and multifunction devices. Said Stephen Weber of Cohen & Company regarding these 20 – 60 PPM devices:

These machines will provide superior performance to light lens products (better copy quality, higher reliability, modularity + digital features). Moreover, we gather that these systems will be priced at just a 10% premium and initially positioned as copiers, which plays to Xerox's vaunted direct sales strength. This approach, plus Xerox's clear time-to-market lead (they will hit volume in Q2), augurs for rapid market acceptance.<sup>25</sup>

These products represented just some of the 24 new product introductions planned for 1997<sup>26</sup> and after the launch another analyst said, "estimates are that the company is a year ahead of its competition."<sup>27</sup> Later digital product introductions in the year included those introduced at the On Demand trade show in New York in early May. These included the DocuTech 180 production publisher (a faster, 180 PPM version of Xerox' flagship product which used to only be available in 135 PPM trim), the DocuPrint 180 (a transaction printer version of the DT 180), and the DocuColor 70 (a 70 PPM color device OEMed from Xeikon N.V.).<sup>28</sup> Additionally, one of Xerox' last new light lens products was launched in September, the 120 PPM black and white 5800.

Confident in the future and aggressively trying to grow the business, in 1997 Xerox decided to expand the size of its direct sales force. At a management meeting with investors and analysts in early March A. Barry Rand, Executive Vice President of Customer Operations, indicated that the

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<sup>24</sup> Allaire, Paul A. CEO's Letter in the Xerox Corporation 1996 Annual Report, March 3, 1997, p. 8.

<sup>25</sup> Weber, Stephen R. Cowen & Company Perspectives on Xerox Corporation, March 5, 1997.

<sup>26</sup> Mandresh, Daniel. Merrill Lynch Comment on Xerox Corporation, February 27, 1997.

<sup>27</sup> Hokanson, Rudolf A. Deutsche Morgan Grenfell US Equities Research on Xerox Corporation, April 17, 1997.

<sup>28</sup> Henderson, B. Alex, Randolph, Allen, and McPeake, John P. Prudential Securities Xerox Corp. Company Update, May 8, 1997.

size of the sales force was planned to grow roughly 8% per year for the next several years which “considerably exceeds historical levels.”<sup>29</sup>

Xerox also restructured its internal organization to better align with the key areas of its business. In particular, five business units were formed: production systems (focusing on high-end hardware), office products (focusing on mid-range equipment primarily for the office), document services (comprising both document outsourcing and software), channels (to enhance Xerox’ distribution of low-end products through retail, reseller, and distributor outlets), and supplies (to manufacture and market toner, paper, and other consumables).<sup>30</sup> Another very significant internal organizational event in 1997 was the June hiring of G. Richard Thoman as Chief Operating Officer with the expectation that he would become CEO within a year or two upon Allaire’s expected retirement. Thoman, formerly the Chief Financial Officer at IBM, was described by Allaire as “an excellent, well-rounded executive...he was a step above what we had internally.”<sup>31</sup> Prudential Securities, reacting after an engagement with Thoman that came six months after he was on the job, said “We came away impressed.”<sup>32</sup>

All in all, things were looking very bright for Xerox in 1997. Said one analyst “Xerox is ‘The Document Company.’ We believe that this is truer than ever. The document is a key element of business productivity, and in our opinion, no one in the world seems to understand all of its nuances better than Xerox.”<sup>33</sup> In October Xerox made *Fortune* magazine’s list of the world’s most admired companies (#7 in the “Computers, Office Equipment/Data Services” category).<sup>34</sup> Senior management summed up the year as follows:

We have now achieved critical mass. Consider this:

- Revenues from digital products grew 25 percent. They now account for 36 percent of total.
- Revenues from color copying and printing grew by 46 percent to \$1.5 billion. We are the leader in the color markets we serve.
- Revenues from our document outsourcing business grew by 58 percent to \$2.0 billion. We have the largest market share in this fast-growing business.
- Our new line of digital black-and-white copiers was a huge success, with sales more than double expectations.

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<sup>29</sup> Henderson, B. Alex, Mastey, Glen D., and McPeake, John P. Prudential Securities Xerox Corp. Company Update, March 4, 1997.

<sup>30</sup> “Xerox is Reorganizing to Stress Supply Sales, Retailers, New Markets.” *The Wall Street Journal*, March 19, 1997.

<sup>31</sup> “Success at IBM Gives Thoman Edge at Xerox.” Ziegler, Bart, *The Wall Street Journal*, June 13, 1997.

<sup>32</sup> Henderson, B. Alex, Randolph, G. Allen, and McPeake, John P. Prudential Securities Xerox Corporation Company Update, April 15, 1998.

<sup>33</sup> Hokanson, Rudolf A. Deutsche Morgan Grenfell US Equities Research on Xerox Corporation, March 3, 1997.

<sup>34</sup> “The World’s Most Admired Companies.” Fisher, Anne, *Fortune*, October 27, 1997, p. 220.

- We established a Channels organization, which generated \$1.2 billion in revenues.
- Our employee and customer satisfaction levels are at an all-time high. That is hardly surprising. We believe strongly that a motivated work force leads to improved customer satisfactions, which drives business results.<sup>35</sup>

Overall, comparing 1997 to 1996, total revenues were up 4.5%, net income was up 20.4%, and diluted earnings per share from continuing operations were up 21.7%. Total employment at year-end was 91,400.<sup>36</sup> For the third consecutive year, the Board of Directors declared an increase in the annual stock dividend, this time a 13% increase.<sup>37</sup>

Moving past 1997 Xerox senior management began to make some significant organizational changes that would eventually contribute to the dynamics that are the subject of this thesis. The first of these was the April 7, 1998 announcement of a major restructuring program. This program primarily entailed the elimination of about 9,000 jobs worldwide and the ultimate projected savings of \$1 billion annually. It also entailed the consolidation of what used to be four geographically-structured U.S. customer administrative centers (which used to supplement the work done at the local CBU level) into three that would be focused by customer segment and the consolidation of the formerly CBU-based administrative functions into these same three centers. This was something done to enable “improved customer support at lower cost.” Commented Allaire about the entire restructuring “This repositioning will strengthen us financially and enable strong cash generation” and the implication in the text of the press release from which this quote was taken was that reducing administrative costs was a significant objective.<sup>38</sup>

What actually happened as a result of this administrative center reorganization will be discussed in greater detail later, but at the time analysts were in general supportive of it. Said Daniel Kunstler of J.P. Morgan “I feel very positive about it...They’re doing it from a position of strength rather than doing something defensive.”<sup>39</sup> Said another, “Overall, we view these actions as very positive.”<sup>40</sup>

Despite whatever long-term effects this reorganization ultimately may have had, overall 1998 turned out to be yet another very successful year for Xerox and one in which it seemed to be solidifying its focus. Brian Stern, President of Xerox’ Office Document Products Group at the time, gave a presentation to Prudential Securities’ first annual Imaging Technology Conference in which he outlined what Xerox management viewed at the time as the four key transformations facing the industry and Xerox. These were the transitions from analog to digital, from stand-

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<sup>35</sup> Allaire, Paul A. (Chairman and Chief Executive Officer) and Thoman, G. Richard (President and Chief Operating Officer). Letter to Shareholders in footnote 10, March 3, 1998, p. 2.

<sup>36</sup> Data in these two sentences from or derived from figures in footnote 10, p. 30.

<sup>37</sup> Same as footnote 10, p. 4.

<sup>38</sup> Material in this paragraph is from “Xerox Announces Worldwide Restructuring to Enhance Competitiveness in the Digital World.” Xerox Corporation press release, April 7, 1998.

<sup>39</sup> As quoted in “Xerox Cutting 9,000 / Firm Praised for Acting While on the Upswing.” Einstein, David, *The San Francisco Chronicle*, April 8, 1998.

<sup>40</sup> Hokanson, Rudolf A. and Dopman, Laura A. CIBC Oppenheimer Investment Conclusion on Xerox Corporation, April 7, 1998.

alone to networked, from black and white to color capable, and from boxes to services and solutions.<sup>41</sup> The company's 1998 results seemed to suggest that the company was executing each of these four transitions well. Digital revenue (pre-currency) grew 36% from 1997. In December (usually Xerox' strongest month for equipment sales), 45% of the Document Centre 220 and 230 models that were sold were network connected, the highest rate for the year. Color revenues were up 26.7% over 1997, now representing 9.8% of revenues. And document outsourcing and solutions revenue rose 25% over 1997, to exceed \$3 billion. Overall, Xerox launched 95 new products in 1998 and total revenues were up 7.2% over 1997 to \$19.4 billion. For the fourth consecutive year the dividend was increased, this time by 11%, and moreover the Board approved a two-for-one stock split.<sup>42</sup>

The second major organizational announcement that would become a focus of this thesis was first announced by the company in early January 1999. The announced plan was that Xerox was going to reorganize its document processing business into four operations. One was Business Group Operations that would encompass all manufacturing and supply chain operations as well as product development for the office and production environments. Another group was Developing Markets Operations that would concentrate on growing business in developing and emerging markets and countries. Still another group was General Markets Operations that would concentrate on developing and marketing low- and mid-range products for distribution through retail, indirect, and other channels that did not require the use of the direct sales force. Finally, and most significantly, was the creation of the Industry Solutions Operations group. This group was to be responsible for providing "an integrated industry focus for global customers, offering total solutions – hardware, software and document services." Initially, four industry segments were targeted: financial services, manufacturing, graphic arts, and the public sector. Additionally, this group was given responsibility for the direct sales staff in North America and Europe. Said Thoman at the time:

We believe these changes will better align Xerox to serve its diverse customers, increase the effectiveness, efficiency and breadth of our distribution channels and provide an industry-oriented focus for global document services and solutions. ... This migration to an industry global account and solutions focus will evolve over the next couple of years. In 1999, there will be no significant changes to sales force territories or compensation.<sup>43</sup>

Said a contemporaneous article about the reorganization:

The major thrusts are to recast the document company's direct-sales force as a corps that will concentrate as much on software and applications as equipment, and to greatly expand retail and Internet distribution. ... But while Xerox sales personnel might wonder at their future as the company moves more into lower-

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<sup>41</sup> Stern, Brian. As quoted in Prudential Securities Xerox Corporation Company Update, July 1, 1998.

<sup>42</sup> From or derived from various pages in footnote 18.

<sup>43</sup> Material in this excerpt, and the paragraph above it, is from "Xerox Realigns Operations to Better Capitalize on New Growth Opportunities in the Digital Marketplace." Xerox Corporation press release, January 6, 1999.

margin arenas in which they are largely superfluous, management is creating a new role for them with which it hopes to boost its high-end equipment sales.<sup>44</sup>

In the same article, the following analysis is attributed to analyst Jack Kelly of Goldman Sachs & Co.:

...the company seems to be heading off problems such as it experienced in 1995 and 1996, when it revamped sales operations and saw a mass exodus of staffers worried about their future with the firm.<sup>45</sup>

Obviously sensitive to their experience of a few years earlier, senior management is discussed and quoted in the conclusion to this same article as follows:

Though much of the realignment will focus on the firms direct-sales force, changes will not be made too quickly and will not affect compensation – a point Allaire and Thoman made pains to impress on workers at meetings in Rochester this week.

The reassurances were aimed as much at customers as at Xerox's sales staff, Allaire said.

"We are not going to suddenly change any customer relationships," he said.

"We'll do a certain amount, but we're going to do this gradually. We've learned from our mistakes."<sup>46</sup>

Further describing the transformation facing the Xerox sales force was an article from USA Today:

"Today, we do much more of a consultative sale and we're looking really to figure out what are (the customer's) critical business processes and how we can add value," says Xerox's Joe Valenti, newly named chief of staff for North American solutions. "It's much more than just selling a box."<sup>47</sup>

In early April of 1999 Thoman succeeded Allaire as CEO, with Allaire remaining as Chairman. Shortly thereafter, first quarter results were announced which, despite profit from continuing operations rising 14%, included the fact that revenues were unchanged (both relative to 1Q98). An article in the Wall Street Journal quoted Chief Financial Officer Barry D. Romeril as saying "If we didn't quite shoot ourselves in the foot, we certainly hit several toes." He was referring to the unanticipated effects of the reorganization announced in January: namely, that it had required its sales force "to spend more time in training and developing than selling products" according to the article. In addition, the article attributes to analyst Ben Reitzes of PaineWebber Inc. the fact

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<sup>44</sup> "Xerox Reorganizes to Align Firm with Changing Market." Astor, Will, *Rochester Business Journal*, January 8, 1999.

<sup>45</sup> Same as footnote 44.

<sup>46</sup> Same as footnote 44.

<sup>47</sup> "Technology is Changing Face of U.S. Sales Force." Belton, Beth, *USA Today*, February 9, 1999.

that Xerox was facing increased competition from Canon Inc. which had recently introduced a line of digital copiers that undercut Xerox' Document Centre line in price by about 10%.<sup>48</sup>

Regardless of the unexpected first quarter results, Xerox continued to elaborate on its new industry focus. In London on April 27<sup>th</sup> Thoman gave a speech at a Xerox-sponsored "industry solutions event." In it he repeated the tagline from press releases that had been circulated earlier at the event: "Xerox Corporation today announced no new products." His point was to draw attention to the announcement of the first 17 solutions in the "Xerox Global Industry Solutions Portfolio." In addition, he reiterated the rationale behind the reorganization:

In January...Xerox reorganized...creating a new Industry Solutions group to leverage the strength of the Xerox direct sales force – already recognized as one of the world's best-trained and most successful. Before the January reorganization...we were focused on products and geography. But today...we're increasingly organized by industry...and on developing and delivering end-to-end solutions.<sup>49</sup>

Despite the initial reorganization plan that called for a phased approach that would not affect all sales people, by the third quarter of 1999 the company decided to expand the reorganization:

Xerox company spokesman Carl Langsenkamp said Thursday that the company made an internal announcement last week that it would expand the sales-force realignment it began in January to include all 4,300 sales employees. Before the announcement, Xerox was implementing its changes on a segment-by-segment basis, Langsenkamp said. "The sales team will be in place as we have planned as we head into Jan. 1, 2000," Langsenkamp [sic].<sup>50</sup>

Another source conveyed the news as follows:

Xerox Corp is to reshuffle its sales force for the second time in a year after the earlier reorganization was implicated in the firm's sluggish second-quarter sales growth. Details of the Stamford, Connecticut-based company's decision to divide its sales force into six units from the four created in the January reshuffle, leaked out in a company memo issued last week which was obtained by Bloomberg Business News.<sup>51</sup>

As a result of this revelation, a number of analysts downgraded their targets for the Xerox stock price, including B. Alex Henderson of Prudential and Steven Milunovich of Merrill Lynch.<sup>52</sup> It did not take long for reality to catch up with these predictions. When Xerox warned in early October that third quarter earnings per share would be 10% to 12% lower than 3Q98 and that

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<sup>48</sup> Material up to this point in this paragraph from "Xerox's Earnings Gain, but Revenue Remains Flat." Klein, Alec, *The Wall Street Journal*, April 23, 1999.

<sup>49</sup> Material in this excerpt, and the paragraph above it, is from "XEROX: Xerox Industry Solutions Event 'Competing Through Knowledge' Rick Thoman's Remarks from London." *M2 PRESSWIRE*, April 27, 1999.

<sup>50</sup> Same as footnote 3.

<sup>51</sup> "Xerox in Fresh Turmoil with Latest Sales Force Reshuffle." *Computergram International*, September 17, 1999.

<sup>52</sup> Same as footnote 3.

sales would be flat for the quarter, shares fell 24% in one day.<sup>53</sup> The expected performance made for three consecutive quarters of disappointing results and apparently caught even Xerox executives by surprise, reported *The Wall Street Journal*. Said CFO Romeril "At this stage, we genuinely don't know all the answers," although the article also stated that "Xerox said the restructurings [i.e. the sales force reorganization] continued to affect 'sales productivity.'"<sup>54</sup>

After official results were announced and Xerox had a chance to develop a more comprehensive assessment of what had happened it is significant to note that not only was the sales force reorganization cited but also the customer administrative center reorganization. The *Wall Street Journal* reported it as follows:

A rapid consolidation of billing centers has left Xerox salespeople spending as much as 40% of their time getting orders right and answering billing questions, the company says. That distraction and a reorganization of the sales force has allowed rival Canon Inc. to gain market share and contributed to Xerox's 11% profit drop and flat revenue in the third quarter.<sup>55</sup>

Paradoxically, at about the same time the third quarter was playing out, Xerox was continuing to receive accolades in the business press. In August Xerox was named to *CIO* magazine's list of the 100 Leaders for the Next Millennium<sup>56</sup> and to *Industry Week* magazine's list of the world's 100 best-managed companies, coming in at #76.<sup>57</sup> Xerox also again made *Fortune* magazine's list of the most admired companies in the world, coming in at #1 in the Imaging and Office Equipment Category.<sup>58</sup>

Unfortunately for Xerox, these accolades did not prevent the fourth quarter from being below expectations. In early December of 1999 the company issued an earnings warning of up to 40 percent below expectations for the fourth quarter, citing, among other things "higher than anticipated expenses due to the effects of reorganizing its customer administration system." Shares fell 15 percent on the warning. Said one analyst, Philip Rueppel of Deutsche Banc Alex. Brown, "Many of us who analyze the company from afar do believe that competition is playing a bigger role."<sup>59</sup> Said Gibboney Huske of Credit Suisse First Boston "This announcement represents everyone's worst fears coming to light."<sup>60</sup> The *Wall Street Journal* article from which this quote was taken goes on to say:

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<sup>53</sup> "Disappointing Earnings Warning Sends Xerox Stock Tumbling 24%." From Bloomberg News, as reported in *The Los Angeles Times*, October 9, 1999.

<sup>54</sup> "Xerox's Warning of Poor Earnings in 3<sup>rd</sup> Period Pushes Stock Down 24%." Klein, Alec, *The Wall Street Journal*, October 11, 1999, p. A3.

<sup>55</sup> "A CEO Tussles with a Jam in Xerox Machine." Klein, Alec, *The Wall Street Journal*, October 28, 1999, p. B1.

<sup>56</sup> "Leaders for the Next Millennium: The Honorees." *CIO*, August 15, 1999, p. 148.

<sup>57</sup> "The World's 100 Best-Managed Companies." *Industry Week*, August 16, 1999, p. 90.

<sup>58</sup> "The World's Most Admired Companies." *Fortune*, October 11, 1999, as reported by a Xerox Corporation press release, October 4, 1999.

<sup>59</sup> Material in this paragraph is from "Xerox Warns of Earnings Shortfall." Lavoie, Denise, *AP Online*, December 12, 1999.

<sup>60</sup> "Xerox Sees 4<sup>th</sup>-Quarter Net 40% Below Forecasts." Johannes, Laura, *The Wall Street Journal*, December 13, 1999, p. A3.

Mr. Thoman said year-2000-fearful customers delaying purchases on major printer-copiers were the biggest single reason for the shortfall.

Another problem was that a plan to cut administrative costs by consolidating billing staff blew up in the company's face, resulting in costs to fix problems that resulted, and delayed receipts. The company also blamed a higher level of bad debt, which analysts say was exacerbated by disorganized billing staff during the transition.<sup>61</sup>

Still another *Journal* article, in addition to mentioning that Xerox cited the "poorly executed reorganization of its sales force" as a reason for the fourth quarter earnings warning, also comments on competition-related issues:

Richard Norton, president of DocuTrends, a Saratoga, Calif. consulting firm, is one [who believes that Canon could take the number one spot in copier sales for the year]. "They [Canon] just went gangbusters," he says, despite the fact that Xerox has been in the market with digital copiers a couple of years before Canon. "Xerox shouldn't be ending up in second place."

The same article goes on to say:

Jay Ingalls, research director with information-technology consultant Gartner Group Inc., says Xerox is facing threats on all levels of its business.

In January, Canon is introducing a challenge to Xerox's near-domination of high-volume digital copiers. These machines, the Bentleys of the copier market, are typically found in the central reproduction departments of major corporations. Canon's machine will be made by Heidelberger Druckmaschinen AG, a German printing-press maker, which earlier this year bought the copier design from Eastman Kodak Co. Last year, Xerox's high-end DocuTech printer line had \$2.3 billion in revenue, more than 10% of Xerox's total revenue.

Mr. Ingalls points out another threat to Xerox: the convergence of copiers and printers, which are now often used for many of the same tasks. Printer makers such as Hewlett-Packard Co. and Lexmark International Inc. are poised to introduce products to challenge Xerox's less-expensive machines.<sup>62</sup>

Commenting still further on Xerox' state at the end of 1999, Thoman said "In the process of centralizing our general and administration operations, we lost control of customer service and billing" and "In hindsight my biggest self-criticism would be that...we didn't manage that administration area."<sup>63</sup>

Yet another analysis appeared in *Fortune*:

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<sup>61</sup> Same as footnote 60.

<sup>62</sup> The above two excerpts, and the paragraph preceding them, are from "Xerox Faces Mounting Challenge to Copier Business – Canon and Others Cut into Market Share, Especially for Digital Machines." Hechinger, John, *The Wall Street Journal*, December 17, 1999, p. B4.

<sup>63</sup> "Xerox President Q & A." Mullins, Richard, *Rochester Democrat and Chronicle*, December 22, 1999.



He [Thoman] wants to sell “solutions” – software, consulting, document production and storage – not copy machines. To do so, Xerox must reorganize its sales force and back office.

Sounds good in theory. But consider what happened last year when Xerox tried to consolidate 36 administrative centers into just three: One center in Chicago couldn't keep up with orders and billing, and by the time executives realized what was happening, the sales reps were wasting 40% of their time riding herd on customers' orders to ensure they were filled properly. Xerox, “the document company,” fell victim to its own colossal paper jam.

“It was a good design, but we went too far too fast,” say Thomas Dolan, the president of Xerox's Document Solutions Group.<sup>64</sup>

When 1999 4<sup>th</sup> quarter results were finally released, indicating a 52% drop in earnings per share, the company commented as follows:

“We have definitely turned the corner in resolving our customer administration issues in the United States, as demonstrated by a leading indicator – our substantial improvement in U.S. receivables performance. However, there are some lagging impacts that will continue to affect earnings,” Xerox added.<sup>65</sup>

Unlike the previous several years, the 1999 Xerox Annual Report was notably somber. The letter to the shareholders begins “Our 1999 results were clearly a major disappointment.” Overall, total revenues were down 1.1% to \$19.2 billion. Continued Allaire and Thoman, trying to sound upbeat about the future:

...the changes we're making to exploit the opportunities in the digital marketplace are taking longer and proving more disruptive than we anticipated. ... We've made significant progress fixing the problems that occurred when we consolidated our customer administration centers in the United States. We've now completed the realignment of our sales force from a geographic to an industry focus. We expect measurable benefits beginning in the second half of 2000, as our sales people settle into their new assignments and establish new customer relationships. ... We also saw intensifying pressure in the marketplace in 1999, as our competitors announced new products and attractive pricing.

Nevertheless, later in the same Annual Report and addressing the question “what went wrong” Xerox went on to say, among other things:

The consolidation of our customer administration centers in the United States was a productivity initiative that was poorly executed. We initially had too few experienced administrators, so our sales people had to step in to solve billing problems when they should have been in the field with customers.

We saw intensifying pressure in the marketplace in 1999, as our competitors announced new products and attractive pricing. We're prepared to beat back this

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<sup>64</sup> “Xerox Sure is Cheap, but that Doesn't Mean It's a Bargain.” Kahn, Jeremy, *Fortune*, January 24, 2000, p. 178.

<sup>65</sup> Material in this excerpt, and the paragraph above it, is from “Xerox Corp. 4<sup>th</sup> Quarter Net 41 Cents a Diluted Share vs 84 Cents.” *Dow Jones News Service*, January 25, 2000.

challenge and mount our own. In virtually every market segment, we will introduce significant new products in 2000.<sup>66</sup>

It is probably significant that Xerox did not prominently discuss the number of new product introductions in 1999 as it had done the year before. A very approximate count of the number of new hardware products introduced in 1999 adds to about 30, although the number roughly doubles if one also includes the software and solutions introduced in the year.<sup>67</sup>

As Xerox moved through 2000 its performance did not markedly improve. It announced it was cutting 5,200 jobs in April to reduce costs and it reported first quarter income that was down 36% from a year earlier, although revenues were up by 3%, beating some analysts' expectations.<sup>68</sup>

Nevertheless, this small bright spot was not enough to save Thoman's job. With the share price off by 50% from its 52-week high, on May 11<sup>th</sup> the company announced that Thoman was resigning at the request of the Board of Directors. He had been CEO for 13 months. Allaire returned as interim CEO and Anne M. Mulcahy was named President and Chief Operating Officer.<sup>69</sup> Said *The Wall Street Journal*:

In separate interviews, Messrs. Thoman and Allaire called Mr. Thoman's resignation a mutual agreement.

Mr. Allaire had been losing confidence in his successor's ability to solve operational problems fast enough, according to one person familiar with his thinking, while the company was facing the threat of defections by rising stars in manufacturing, engineering, product development and sales management.<sup>70</sup>

As 2000 proceeded Xerox management was primarily concerned with better execution of Xerox' industry-focused strategy and with damage control, especially as performance continued to miss expectations. Xerox issued an earnings warning in June for second quarter results which sent the stock down nearly 19%.<sup>71</sup> When the actual results were announced – an announcement that included a warning that profit projections for the year should be cut – the share price fell another 18%. The source article for this information also went on to say:

In a conference call with analysts, Mr. Allaire said clients had increasingly been willing to buy machines with fewer bells and whistles to save money, hurting sales.

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<sup>66</sup> Material in these two excerpts, and the paragraph above them, is from footnote 9, pp. 1 & 4.

<sup>67</sup> Statistics derived from *The Xerox Online Fact Book* as of July 21, 2001, [http://www2.xerox.com/go/xrx/about\\_xerox/about\\_xerox\\_detail.jsp?view=editorial&id=11170&7/21/01](http://www2.xerox.com/go/xrx/about_xerox/about_xerox_detail.jsp?view=editorial&id=11170&7/21/01).

<sup>68</sup> "Xerox Profit, Excluding Charges, Dropped 36% in First Quarter." Klein, Alec, *The Wall Street Journal*, April 26, 2000, p. B6.

<sup>69</sup> "Xerox Confirms CEO Rick Thoman Resigns." *Dow Jones News Service*, May 11, 2000.

<sup>70</sup> "Xerox's Thoman Resigns Under Pressure – Copier Concern's Chairman will Reassume Position of CEO for Time Being." Hechinger, John and Lublin, Joann, *The Wall Street Journal*, May 12, 2000.

<sup>71</sup> "Xerox Shares Fall on Earnings Warning." *AP Online*, June 16, 2000.

Xerox President Anne Mulcahy said the company also was moving to stem defections in the company's sales force, which is still rankled over a poorly executed reorganization.<sup>72</sup>

Xerox followed up the second quarter with a "bombshell" warning about the third quarter that it would post a loss, marking the fourth profit warning in five quarters.<sup>73</sup> At the same time third quarter results were announced, which did in fact include a loss – the first one in 16 years – the company simultaneously announced a major "turnaround" operation that was to include layoffs, cost reductions, and asset sales to help relieve its \$18 billion in debt.<sup>74</sup>

As 2000 concluded and rolled into 2001 Xerox continued to try to survive. It fended off rumors that it was filing for bankruptcy protection<sup>75</sup> and gradually described more details of its turnaround strategy. By the time the 2000 Annual Report was issued in July of 2001 – considerably later than normal due to a host of accounting issues not detailed here – the message from senior management was that they were pleased with the progress of the turnaround and expected to return to profitability for the second half of 2001 and for the full year. Nevertheless, total revenues in 2000 were down 4.4% (after a restatement of 1999 revenues) and the company lost \$0.44 per share for the year.<sup>76</sup> Since then Xerox actually reported a loss in the third quarter of 2001, with the effects of September 11 being cited as part of the reason for the loss, although the company at the time was "cautiously optimistic" about returning to profitability in the fourth quarter.<sup>77</sup>

The charts on the following pages provide a high-level picture of key aspects of Xerox' business performance over the timeframe from 1995 through the third quarter of 2001. As I have mentioned before, there are numerous contributors to the figures graphed here and it can not unequivocally be said that the performance pictured here is due only to the factors and dynamics discussed in this section. Nevertheless, by now the reader should be reasonably convinced that these factors played a major part in this performance. Certainly the most dramatic of the graphs are the ones for earnings per share and the share price.

Finally, it should be mentioned here that to facilitate comparisons between the historical performance of Xerox and the eventual dynamics simulated by the system dynamics model I created, and also so as to focus the model on just the timeframe germane to the main factors studied here, I have chosen to start my "model time" at the beginning of 1998. This was just before the first of any of the three primary factors I have studied took effect (the customer administrative center reorganization which was announced in April, 1998). The reader will see that on the stock price graphs I have normalized and scaled the values for each of the three major stock market indices (the Dow Jones Industrial Average, the S&P 500, and the Nasdaq) such that

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<sup>72</sup> The material in this excerpt, and the sentence before it, is from "Xerox Won't Meet Expectations for the Year." Hechinger, John, *The Wall Street Journal*, July 27, 2000.

<sup>73</sup> "Magnitude of Xerox's 3<sup>rd</sup> Quarter Warning Surprises Some Analysts." Maio, Pat, *Dow Jones News Service*, October 2, 2000.

<sup>74</sup> "Analysis: Xerox's Financial Troubles Lead to Employee Layoffs to Try and Reduce its Debt Load." Speer, Jack, *NPR: All Things Considered*, October 24, 2000.

<sup>75</sup> "How Xerox Ran Short of Black Ink." Moore, Pamela L., *Business Week*, October 30, 2000, p 56.

<sup>76</sup> Material in this paragraph after footnote 75 from the Xerox Corporation 2000 Annual Report.

<sup>77</sup> Xerox Corporation press release, October 23, 2001.

they are numerically equal to the Xerox stock price close on the first day of trading in 1998 (which was January 2).

### Xerox Earnings per Share from Continuing Operations 1995 - 2001

Source: Xerox Corporation Annual Reports and 10-Q and 10-K SEC filings. Data is as it was presented at the time for each respective period and thus does NOT include alterations due to subsequent restatements, if any.

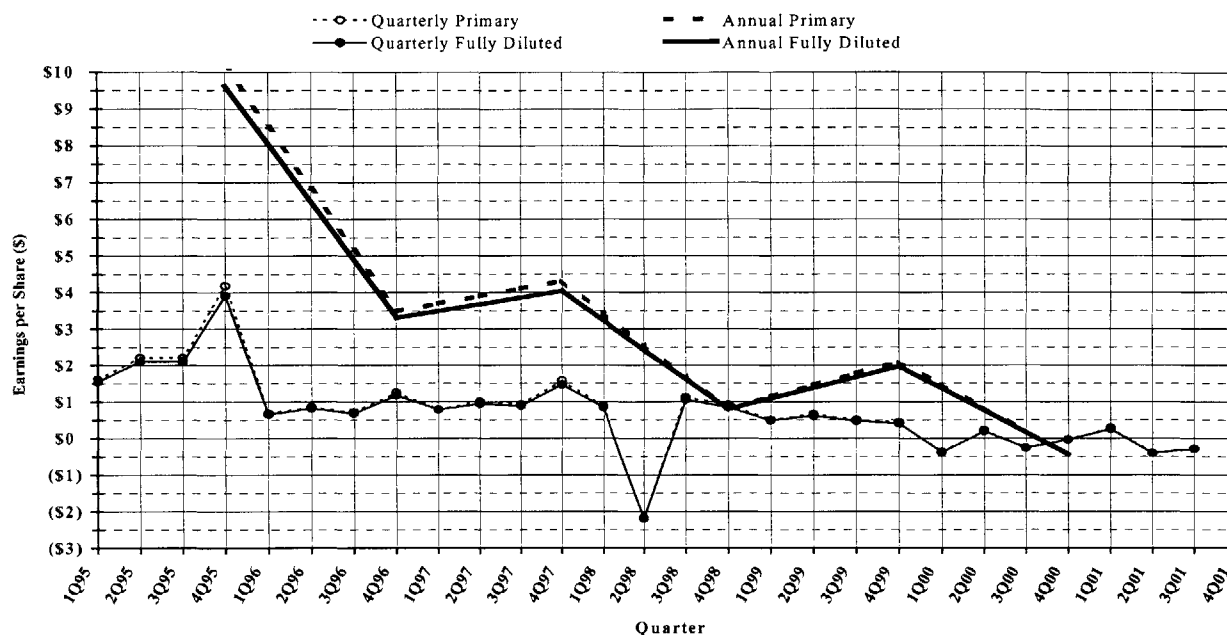


Figure 1: Xerox Earning per Share from Continuing Operations 1995 - 2001

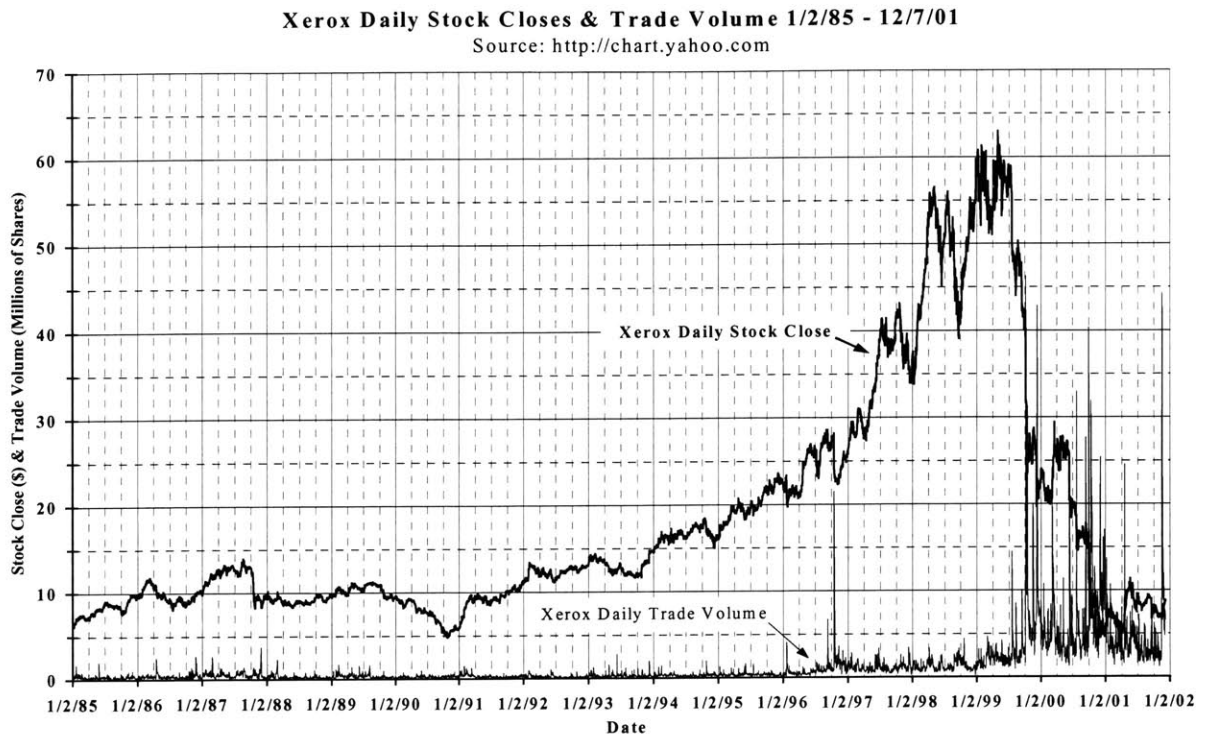


Figure 2: Xerox Daily Stock Closes & Trade Volume 1/2/85 – 12/7/01

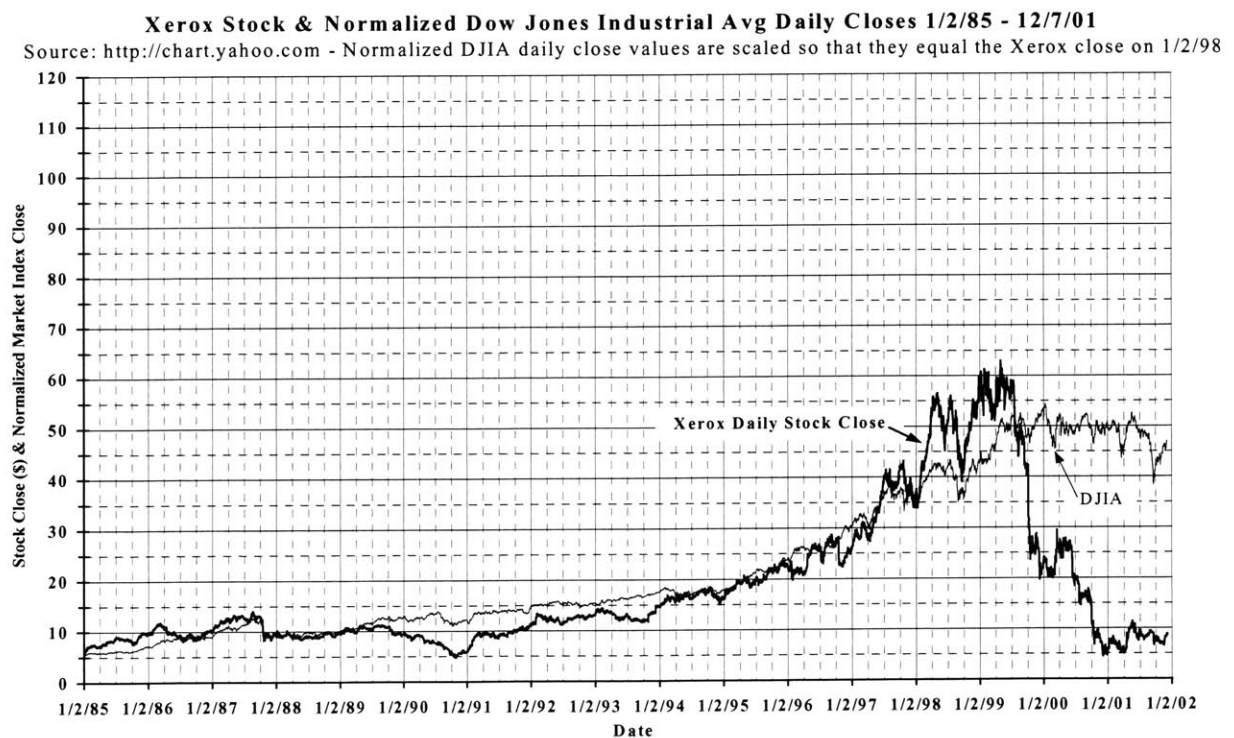


Figure 3: Xerox Stock & Normalized Dow Jones I. A. Daily Closes 1/2/85 – 12/7/01

#### Xerox Stock & Normalized S&P 500 Daily Closes 1/2/85 - 12/7/01

Source: <http://chart.yahoo.com> - Normalized S&P daily close values are scaled so that they equal the Xerox close on 1/2/98

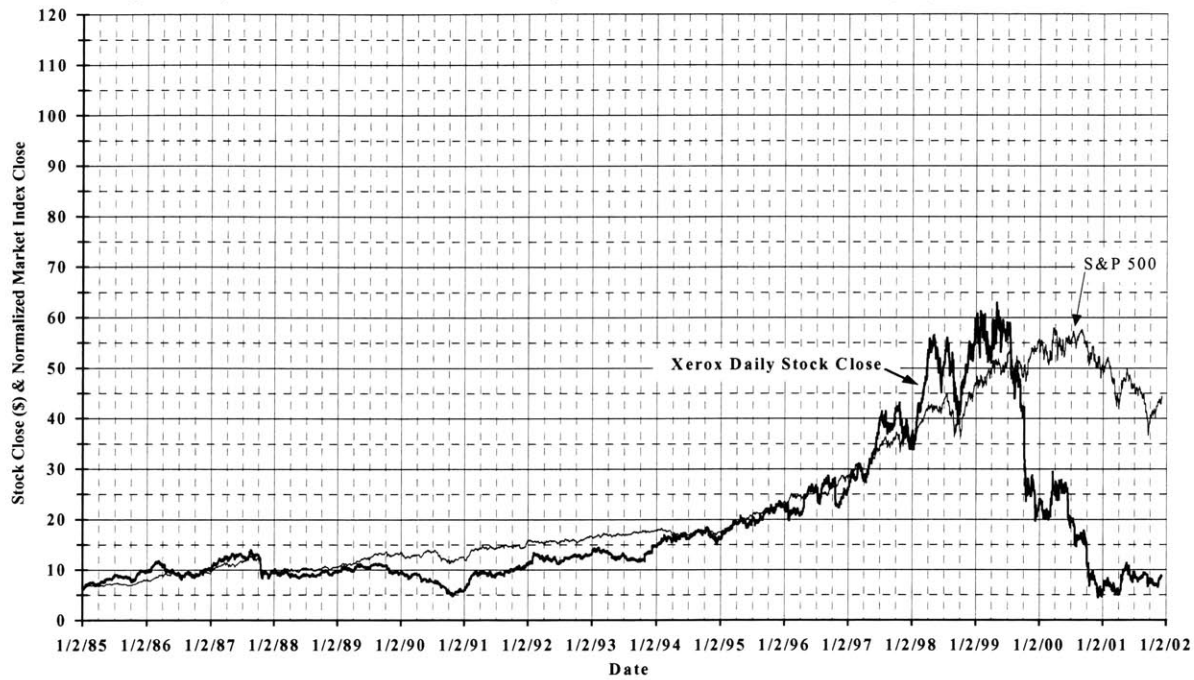


Figure 4: Xerox Stock & Normalized S&P 500 Daily Closes 1/2/85 – 12/7/01

#### Xerox Stock & Normalized Nasdaq Daily Closes 1/2/85 - 12/7/01

Source: <http://chart.yahoo.com> - Normalized Nasdaq daily close values are scaled so that they equal the Xerox close on 1/2/98

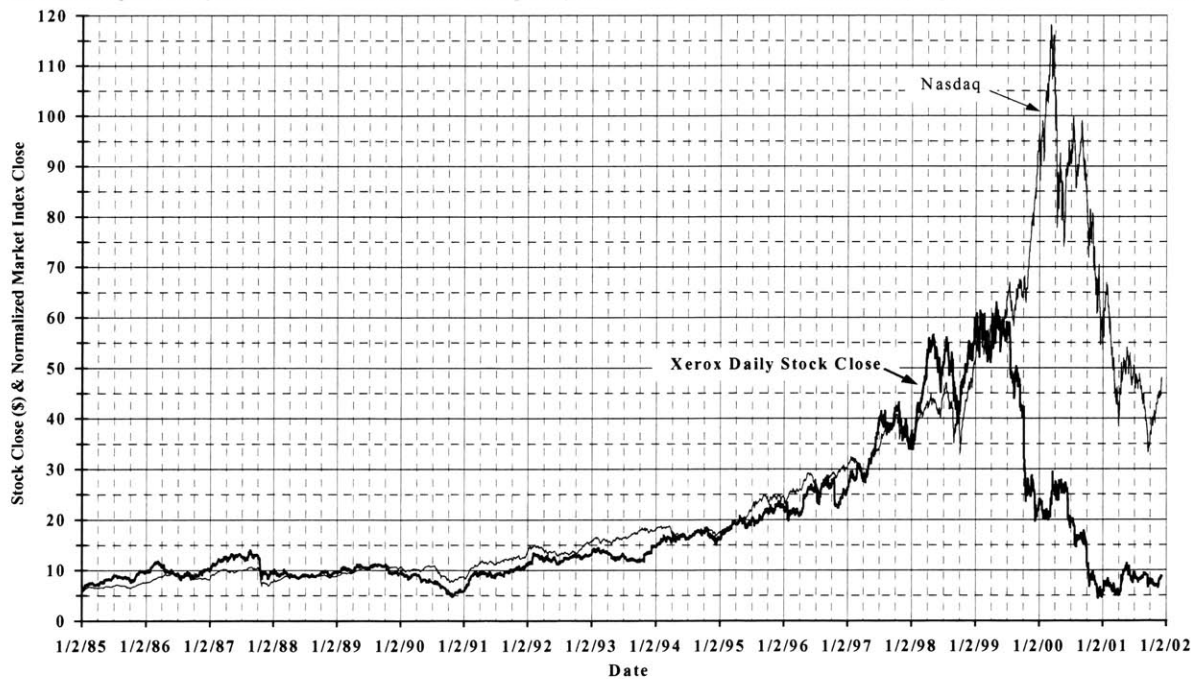


Figure 5: Xerox Stock & Normalized Nasdaq Daily Closes 1/2/85 – 12/7/01

### Xerox Document Processing Revenue 1995 - 2001

Source: Xerox Corporation Annual Reports and 10-Q and 10-K SEC filings. Data is as it was presented at the time for each respective period and thus does NOT include alterations due to subsequent restatements, if any.

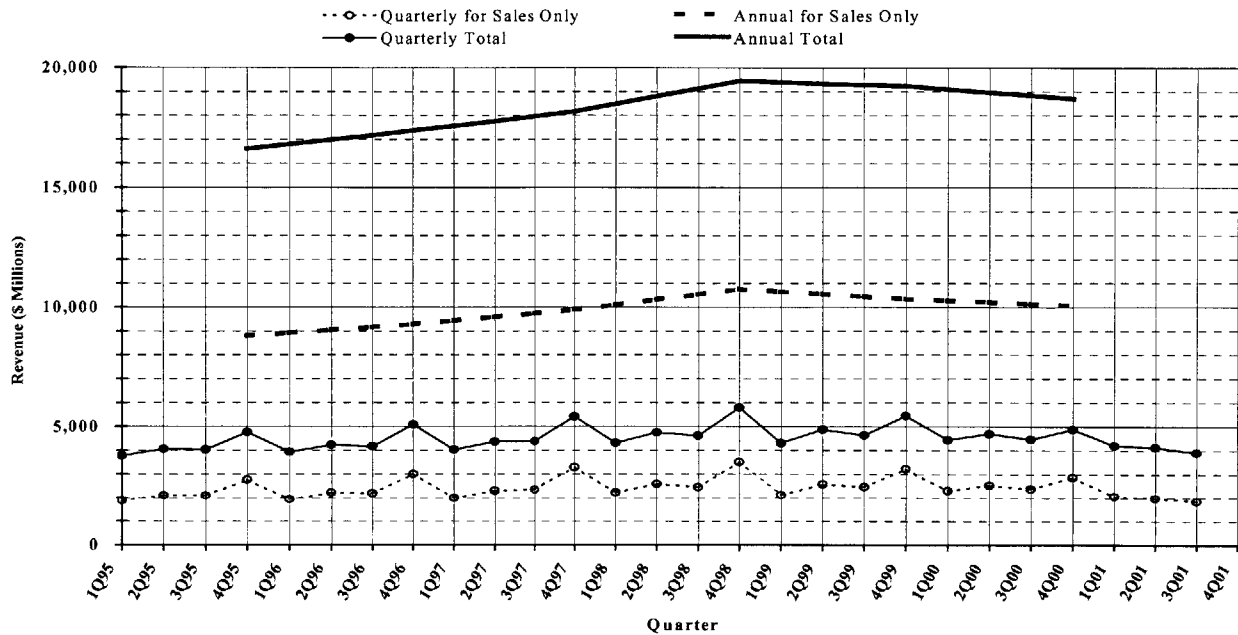


Figure 6: Xerox Document Processing Revenue 1995 – 2001

### Xerox Income from Continuing Operations 1995 - 2001

Source: Xerox Corporation Annual Reports and 10-Q and 10-K SEC filings. Data is as it was presented at the time for each respective period and thus does NOT include alterations due to subsequent restatements, if any.

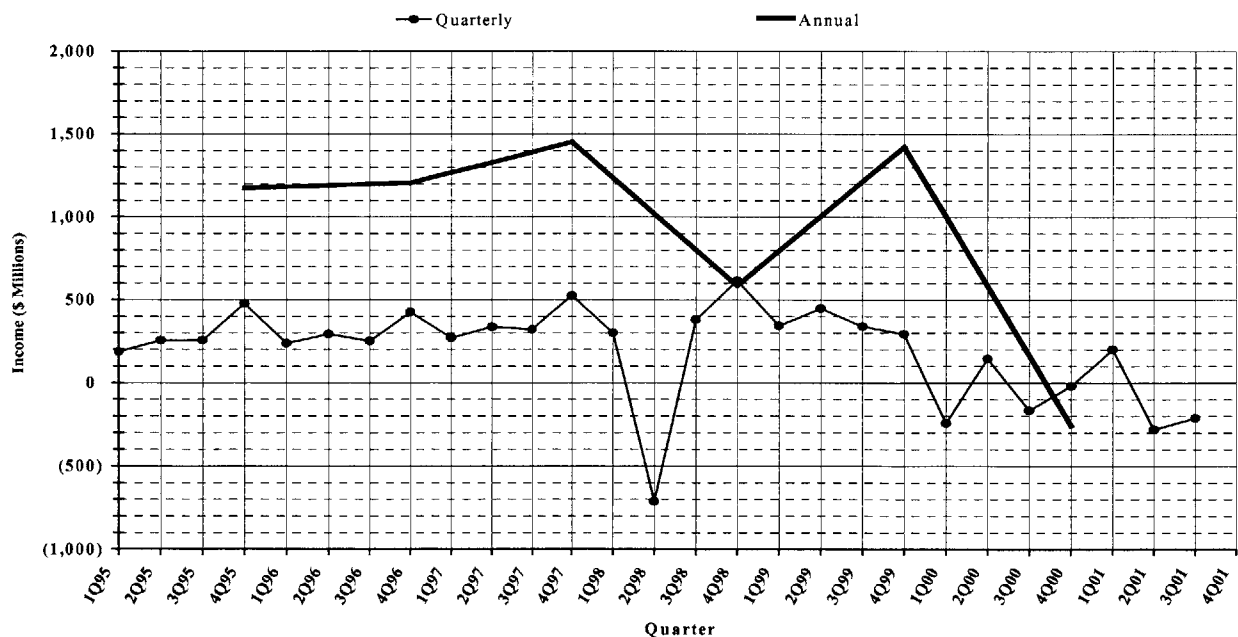


Figure 7: Xerox Income from Continuing Operations 1995 - 2001

### Xerox Document Processing Selling, Administrative & General Expenses 1995 - 2001

Source: Xerox Corporation Annual Reports and 10-Q and 10-K SEC filings. Data is as it was presented at the time for each respective period and thus does NOT include alterations due to subsequent restatings, if any.

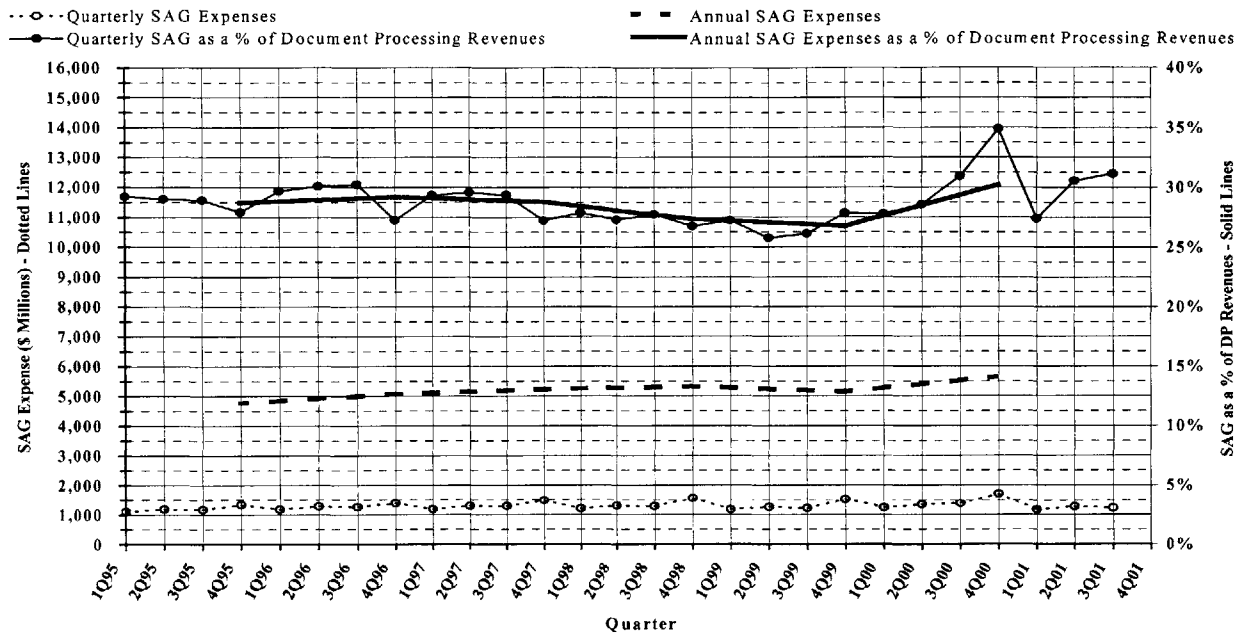


Figure 8: Xerox Document Processing Selling, Administrative & General Expenses 1995 - 2001

### Xerox Sales Gross Margin 1995 - 2001

Source: Xerox Corporation Annual Reports and 10-Q and 10-K SEC filings. Data is as it was presented at the time for each respective period and thus does NOT include alterations due to subsequent restatings, if any.

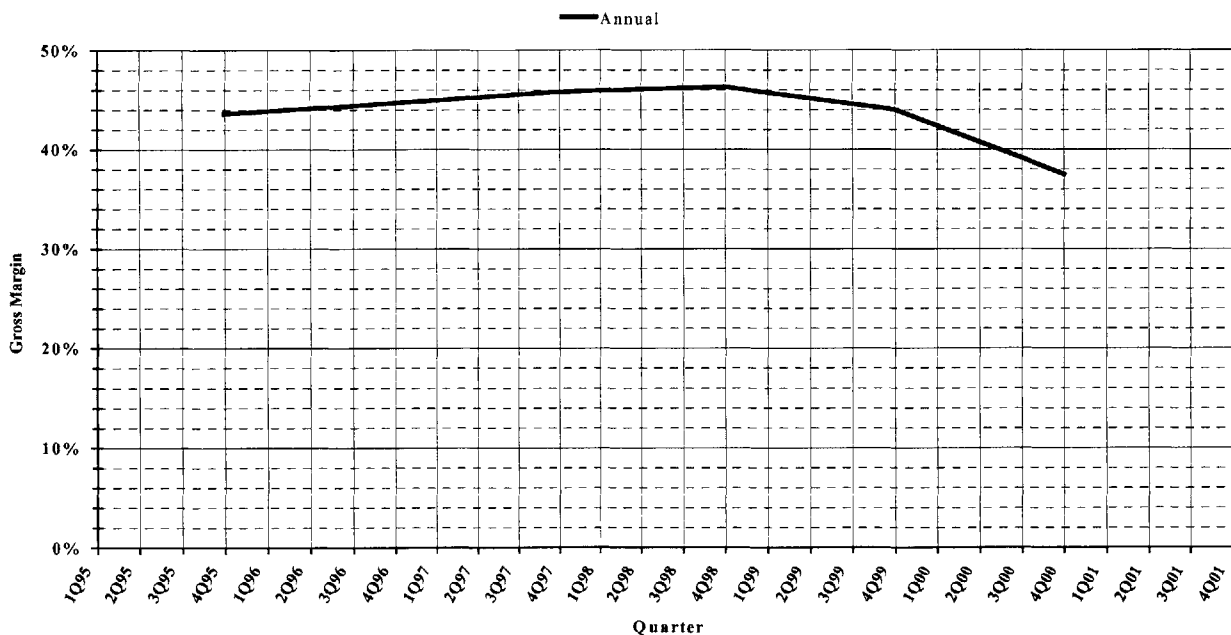


Figure 9: Xerox Sales Gross Margin 1995 - 2001



## **4. Approach**

### **4.1 General Approach**

The overall approach taken in this thesis has been to research what happened to Xerox over the course of its decline at the turn of the millennium, glean and/or hypothesize from that research the general causal factors and feedbacks involved, and from that base create a system dynamics model linking the key factors that are the subject of the thesis. The model is then further used to try to understand what happened and why. There are two important points worth mentioning in regard to this overall approach. First, although I have interviewed a number of Xerox sales, marketing, and management personnel during the course of my research, the vast majority of the research conducted has been from public sources. This has been intentional. Great care has been taken to ensure that no detailed proprietary Xerox data of any sort has been incorporated into this document, nor any data that Xerox has purchased from external consultants which is only licensed for internal Xerox use. Even if there were no concerns about proprietary information or Xerox/consultant licenses, there would probably still not be a significant change to the overall approach taken here because obtaining detailed internal data would have required the use of more time and internal contacts than I happened to have available to me.

This brings up the second point. Namely, the overall nature of this modeling effort from a system dynamics perspective is what James Lyneis of Pugh-Roberts Associates refers to as a “small, policy-based model.” In other words, it is concerned primarily with trying to understand how the structure of a system leads to its observed behavior (the process of deriving “insight”).<sup>78</sup> It has not been what he would call a detailed, calibrated modeling effort in which a large part of the goal is to model the problem in sufficient detail to accurately determine price/benefit tradeoffs of various solution alternatives. Put another way, my goal has been to determine and analyze the high-level structures that came into play in Xerox’ decline, not to make any quantitative predictions about the absolute values of any particular financial metrics. In fact, as the reader will see, the model created does not even have any direct financial parameters in it. As mentioned above, the reasons for this are in part because those are proprietary and in part because collecting that information in the detail requisite to making accurate predictions was beyond the scope of this exercise. Even if those were not barriers there are so many contributors to Xerox’ ultimate financial performance that doing any predictions based only on the limited set of factors considered here likely would be somewhat spurious. Nevertheless, this is not to say that the model is not realistic. On the contrary, I have made every effort to try to incorporate structures that I believe accurately capture the essential dynamics of what transpired and I have similarly attempted to use realistic parameter values, based on my research and on my own experience in the industry and the company.

Finally, it must be mentioned that the author is fully aware of the fact that hindsight can be much clearer than foresight, and I have had nothing but the benefit of hindsight in writing this thesis. The issues involved in Xerox’ decline, even just the small set of those that are studied here, were complex in and of themselves and, when combined with all of the other factors involved, no doubt resulted in an even more complicated situation facing the company.

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<sup>78</sup> Lyneis, James M. Guest lecture notes in Prof. Jim Hines’ 15.982 System Dynamics: Managing Complexity class at MIT, July 21, 2000.

## 4.2 Overview of Model and Document Structure

The system dynamics model constructed for this study has been created in the software package Vensim by Ventana Systems.<sup>79</sup> This software package features, among other things, the use of “views” which are similar to different pages within a spreadsheet. This has provided a convenient way to arrange the contents of the model such that each view contains, as much as possible, a logically related portion of the overall model. Additionally, the approach taken has been to construct the model in a tops-down fashion, and as such each successive view of the model contains details about an element or elements initially introduced in a previous view.

The structure of the remainder of this thesis document follows the exact same progression as the layout of the views within the model itself. Thus, each of the next ten sections of the document is concerned with each of the ten views in the model. However, the important point is not that the document happens to follow the structure of the model but instead that both the model and the discussion here are organized in a way that hopefully facilitates understanding of the model and, more importantly, the dynamics that have played out regarding Xerox. Within each of these next ten sections, I first describe the overall issues involved in the topic being addressed. I then describe and show how that section of the model has been constructed and how the structure chosen relates to the issues involved. Also, when appropriate, I analyze this section of the model – with all other elements of the model held constant or decoupled – and discuss the results of these analyses. After all sections have been described, I exercise the entire model as an entity, analyze these results, and use all this as a basis for the derivation of the key insights of the thesis. Finally, I offer recommendations for enhancements to the model that might be pursued to capture further dynamics that may be of significance.

It should be noted that the fundamental unit of time in the model is one month. All simulations were conducted utilizing the default numerical integration algorithm (Euler) with the smallest allowable time step (0.0078125). The latter may not have strictly been necessary to obtain accurate results but, since there was essentially no extra time or resource cost to utilize the smallest time step, I figured there was no reason not to use this resolution. I ran all simulations for at least ten years (120 months), although in some cases I ran them to 20 years (240 months) to demonstrate a point.

## 4.3 A Brief Word about Commonly Used Lookup Tables

In a fair number of places within the model I utilize lookup tables to convert some input, usually a dimensionless ratio whose “normal” value is one, into some output effect (whose “normal” value is also one). In a number of cases I found it desirable to have a lookup table curve that met a couple of particular criteria. One is that it goes through the point (1, 1). Another is that it goes through the point (0, 0). And a third is that it represents “diminishing returns.” In other words, as the input rises, the corresponding increase in the output is less and less. Certainly I could have created such a table by hand (and in fact I did). However, recognizing that I knew I would need a number of lookup tables with curves meeting these criteria, although with slightly different shapes, I decided to come up with a more generic curve that would be easier to replicate. I first tried the square root function but I did not like the shape of it – it was too steep above x (the

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<sup>79</sup> Vensim, The Ventana Simulation Environment. Vensim DSS32 Version 4.1. © 1988 – 2000 Ventana Systems, Inc., 60 Jacob Gates Road, Harvard, MA, 01451, <http://www.vensim.com>.

input variable) = 1 and it had too much of a “knee” near  $x = 0$ . I then tried the cube root function. It was even worse in this latter regard, although it was better beyond  $x = 1$ . I then experimented with a number of variations involving the exponential function and eventually ended up with a function that involves just one parameter which nicely controls its shape. The parameter is  $a$  and the function is the following:

$$f(x) = \frac{1 - e^{-ax}}{1 - e^{-a}}$$

I have graphed three samples of this function below for values of  $a$  in the range of those used in the model. My procedure to create these lookup tables was to go to an Excel spreadsheet where I had the function values computed, plug in a value for  $a$ , inspect a plot of the function in Excel, and vary  $a$  if necessary until it met my visual “sense check” that it looked about right. After it did, I would import the values into Vensim. This procedure turned out to be far more efficient than creating each of these lookup tables by hand.

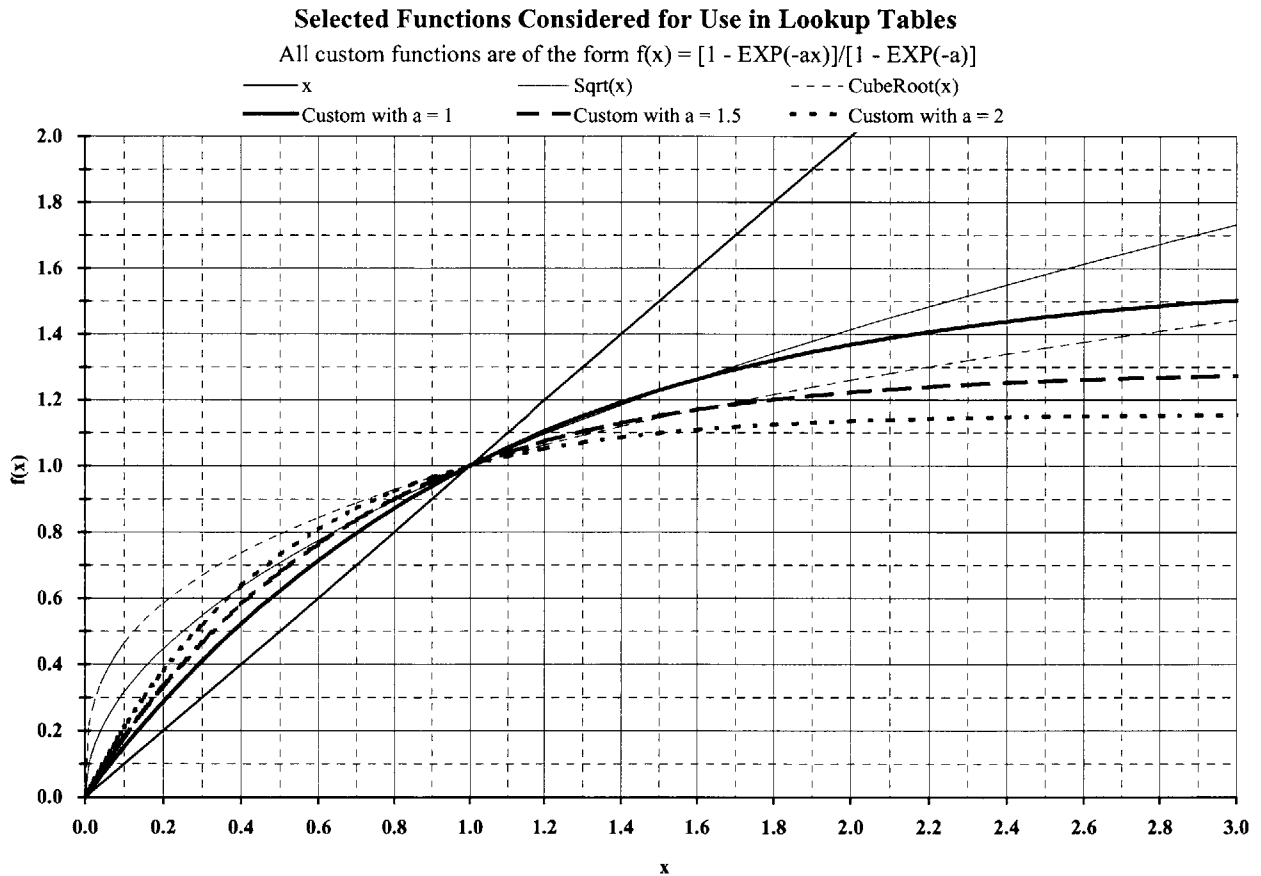


Figure 10: Selected Functions Considered for Use in Lookup Tables

## **5. “Slots”**

### **5.1 Discussion**

My intent for this thesis has been to choose one or a small handful of key metrics to use as the ultimate measure of Xerox’ performance over the course of the timeframe considered here. The review above of Xerox’ recent decline has certainly introduced a substantial number of elements of Xerox’ performance that have had a dynamic history. Some of them, as mentioned before, are corporate-level financial metrics that for various reasons I have chosen to not explicitly model. Others are lower-level metrics that play a part in the larger story but in the end are more “intermediate” than “ultimate.” I eventually decided that the highest-level metric I would track would be Xerox’ market share. This metric is one closely watched in the industry. Although it is not a direct financial metric itself, the discussion above of Xerox’ business model should make it apparent that it is one of the key drivers of the financial performance of a vendor in this industry since it ultimately drives the revenue stream.

There are three key points to bear in mind concerning market share. First, and somewhat paradoxically, because this metric is so important to all in the industry, detailed publicly available data for it is hard to find. Vendors in the industry keep their own proprietary estimates of market share for themselves and their competitors but obviously they are not going to make this data available beyond their own organizations. Some industry analysts and consultants track market share in the document processing world (Gartner Group, IDC, Dataquest, etc.) but their detailed estimates are generally only available on a licensed, contract basis. As would be expected, Xerox has subscriptions to most of the major industry consultants and their market share estimates but the terms of these licensing agreements prevent public disclosure of the data. Secondly, for the market share data that is available, one must be careful to fully understand what the definition of the term being used with the data happens to be. Usually market share is used to refer to the fraction of new sales that go to a particular vendor during some time period. However, other times market share is used to refer to the fraction of all units in the field that are from a particular vendor at a particular point in time. It is this latter definition that I use here. This is because I believe it more directly correlates to a vendor’s overall financial performance since it is the size of the installed base that drives revenues, not just the fraction of new unit sales in a given time period. To look at it another way, the latter definition is essentially the integral of the former and thus inherently includes it. The third point to bear in mind concerning market share is that one must also be careful to note which portion of the overall market is being referenced. All copiers? Digital copiers? Black and white copiers? Black and white printers? Color printers? What speed band? What about multifunction devices – do they count as copiers or printers or both? Etc. Especially for a company like Xerox, whose products are sold in an extremely wide range of markets, it is important to know which slice of the overall market one is talking about.

With the above in mind, the table starting on the following page lists most of the publicly available market share data I found. As can be seen from the variety of types of data in the table, it does not readily lend itself to being put into a single page graph format, at least not if one does not want to inadvertently mix apples and oranges. Nor is the data directly comparable to the definition of market share that I am using since all of the data available is in terms of unit shipments. Nor does the data necessarily fully cover all of the market segments that Xerox is in, in particular the high-end marketplace in which Xerox’ production devices are so prevalent.

Nevertheless, if one considers just the U.S. copier market, the data does show a general trend of increasing then decreasing Xerox market share, with the peak occurring in about 1998.

Date	% Market Share...	...for This Market Segment...	...by This Definition (with footnote reference)...	...but what Wasn't Explicitly Specified...
1995 (full yr)	23%	U.S. copiers	Unit shipments in the year <sup>80</sup>	- Analog vs. digital - B&W vs. color
1996 (full yr)	19%	U.S. copiers	Unit shipments in the year <sup>81</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	27.3%	U.S. copiers	Units sold in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	48.1%	U.S. copiers 16 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	48.1%	U.S. copiers 20 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	21.6%	U.S. copiers 21 – 30 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	< 11.3%*	U.S. copiers 31 – 44 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	10.9%	U.S. copiers 45 – 69 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	30.6%	U.S. copiers 70 – 90 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	81.0%	U.S. copiers ≥ 91 PPM	Unit shipments in the year <sup>82</sup>	- Analog vs. digital - B&W vs. color
1997 (full yr)	1.4%	U.S. mid-range network printers 11 – 30 PPM	Unit shipments in the year <sup>82</sup>	- B&W vs. color
1997 (full yr)	48%	U.S. high-end network printers > 50 PPM	Unit shipments in the year <sup>82</sup>	- B&W vs. color
1998 (start)	40%	B&W copiers < 9 CPM	Unit shipments in the year <sup>83</sup>	- Geographic region - Analog vs. digital
1998 (start)	20%	B&W copiers 9 – 30 CPM	Unit shipments in the year <sup>83</sup>	- Geographic region - Analog vs. digital

<sup>80</sup> “The Share-of-Market Picture for 1999: Business Appliances.” *Appliance*, 57 (9): 85, September 2000. Data source listed is Dataquest.

<sup>81</sup> “The Share-of-Market Picture for 1996: Business Appliances.” *Appliance*, 54 (9): 84, September 1997.

<sup>82</sup> Data here is from, or derived from, “The Road to Wellville.” Fraone, Gina, *Electronic Business*, November, 1998, p. 37. Data source listed is Dataquest.

<sup>83</sup> Weber, Stephen R. Cohen & Company Perspectives on Xerox Corporation, January 30, 1998. Data is listed as “estimated current.”

Date	% Market Share...	...for This Market Segment...	...by This Definition (with footnote reference)...	...but what Wasn't Explicitly Specified...
1998 (start)	23%	B&W copiers 31 – 60 CPM	Unit shipments in the year <sup>83</sup>	- Geographic region - Analog vs. digital
1998 (start)	43%	B&W copiers 61 – 119 CPM	Unit shipments in the year <sup>83</sup>	- Geographic region - Analog vs. digital
1998 (start)	100%	B&W copiers ≥ 120 CPM	Unit shipments in the year <sup>83</sup>	- Geographic region - Analog vs. digital
1998 (full yr)	18.9%	U.S. B&W copiers excluding personal copiers	Unit placements in the year <sup>84</sup>	- Analog vs. digital - Definition of “personal copiers”
1998 (full yr)	28.2%	U.S. B&W copiers including personal copiers	Unit placements in the year <sup>85</sup>	- Analog vs. digital - Definition of “personal copiers”
1998 (full yr)	35.0%	U.S. B&W digital copiers, overall	Unit placements in the year <sup>86</sup>	- Definition of “overall” vs. “excluding PCs”
1998 (full yr)	27.6%	U.S. B&W digital copiers, excluding PCs	Unit placements in the year <sup>86</sup>	- Definition of “overall” vs. “excluding PCs”
1998 (full yr)	3.3%	U.S. color laser printers	Unit retail and mail-order sales in the year <sup>87</sup>	
1999 (full yr)	27.5%	U.S. copiers	Unit shipments in the year <sup>80</sup>	- Analog vs. digital - B&W vs. color
2000 (full yr)	26%	U.S. copiers	Unit shipments in the year <sup>88</sup>	- Analog vs. digital - B&W vs. color

\* Xerox not listed in this category since it was not in top three; #3 in this category had 11.3%

Figure 11: Table of Xerox Market Share Data

Two of the three major factors studied in this thesis – the customer administration centers and the Xerox direct sales force – are elements of Xerox that are dealt with primarily by customers of Xerox’ middle- and high-end product lines. In addition, the middle and high ends of Xerox’ product lines are where the majority of Xerox’ revenues and profits are derived (and it should also be noted that most of the placements of this type of equipment are in the developed world – North America and Western Europe in particular). These two facts mean that the context for the

<sup>84</sup> “Photography & Imaging: Office Equipment Sector: Part 2.” Salomon Smith Barney, April 14, 1999.

<sup>85</sup> “Photography & Imaging: Office Equipment Sector: Part 3.” Salomon Smith Barney, April 14, 1999.

<sup>86</sup> “Photography & Imaging: Office Equipment Sector: Part 4.” Salomon Smith Barney, April 14, 1999.

<sup>87</sup> “Top Color Laser Printer Vendors.” *Computer Retail Week*: 13, February 1, 1999.

<sup>88</sup> “The Share-of-Market Picture for 2000: Part 2.” *Appliance*, 58 (9): 52, September 2001. Data source listed for 2000 data is International Data Corporation.

bulk of the work in this thesis has been the customers of, and products in, the middle and high ends of Xerox' product line. I have used this assumption about the context for the model, the data in the table, and a very unscientific attempt to account for the large market share Xerox commands in the high end of the market, to arrive at a "snapshot" of overall market share owned by Xerox at the start of model time (i.e. the beginning of 1998) that will be used in the model. I will use 30% for this figure. It may not be the exact "right" value, but it strikes me as plausible enough for the purposes of exploring the dynamics of what eventually happened to Xerox.

## 5.2 Description and Analysis of this Subsection of the Model

To compute numbers for my chosen definition of market share (i.e. the fraction of all installed units at any given time that are from a vendor), one must at the very least track the number of systems in the field that belong to all vendors considered. Since my fundamental focus in this thesis has been on Xerox, I make the first of many simplifications of reality by dividing the entire world in to "Xerox" and "the competition." In other words, I lump all of Xerox' competitors into a single bucket and later refer to that bucket as if it were a single vendor. As such, I have a two-vendor system.

To track what I call above the "number of systems in the field," I had to devise some sort of unit to reflect this. Tracking the raw number of machines in the field would certainly be one way to do this. However, I eventually settled on a slightly subtler concept to use – that of a "slot." Per my definition a "slot" is a place within a customer's site occupied by a document processing system from either Xerox or a competitor. This concept more easily allowed me to account for the fact that a customer can have multiple slots that can independently be occupied by systems from different vendors. In fact, most large customers have multiple slots – sometimes numbering in the hundreds – and it is important to note that every single slot, when the system in it needs replacing, can be refilled by either a Xerox or competitive system. To compute market share I compute the total number of slots currently occupied by Xerox products and divide that by the total number of slots in the system. Note that, per the aggregation implicit in only having slots occupied by either Xerox or competitive equipment, I am giving equal weight to slots regardless of what type of equipment occupies them. If one wanted accurately to translate market share into revenues and profits, one would probably have to disaggregate the model into two or more market segments. This is because, from a revenue and profit perspective, one placement of a \$300,000 DocuTech is significantly different than one placement of a \$20,000 Document Centre.

It is here that I make another simplifying assumption. Namely, I consider the population of slots fixed. Certainly, the number of slots in the world is growing. However, when one considers that the focus of this thesis is primarily on the middle- and high-end of the marketplace – which, as stated before, is primarily in the developed world – I do not believe that this assumption will grossly misrepresent reality. I also do not believe that it will significantly alter the dynamics studied here. This is not an analysis of the diffusion of new technology. Instead, it is an analysis conducted in the context of a relatively mature market (especially for copiers) in which I believe that, on an aggregate basis, market share growth for one vendor generally comes at the expense of that for other vendors as opposed to coming from new market creation. (Nevertheless, I have included in the model structure the hooks necessary to allow for the growth and/or contraction of the number of slots for completeness but all slot inflow and outflows are set to zero.) Given this

assumption of a fixed number of slots, and the way that I model the “ownership” of slots (see below), it is irrelevant what the total number of slots in the system is. I have picked the number 1,000 since it is a round number and also one large enough so that the difference between the continuous nature of the variable in the model vs. the integer nature of the variable in reality is insignificant.

With the concept of a slot in mind I created the following to model the variables necessary to compute market share.

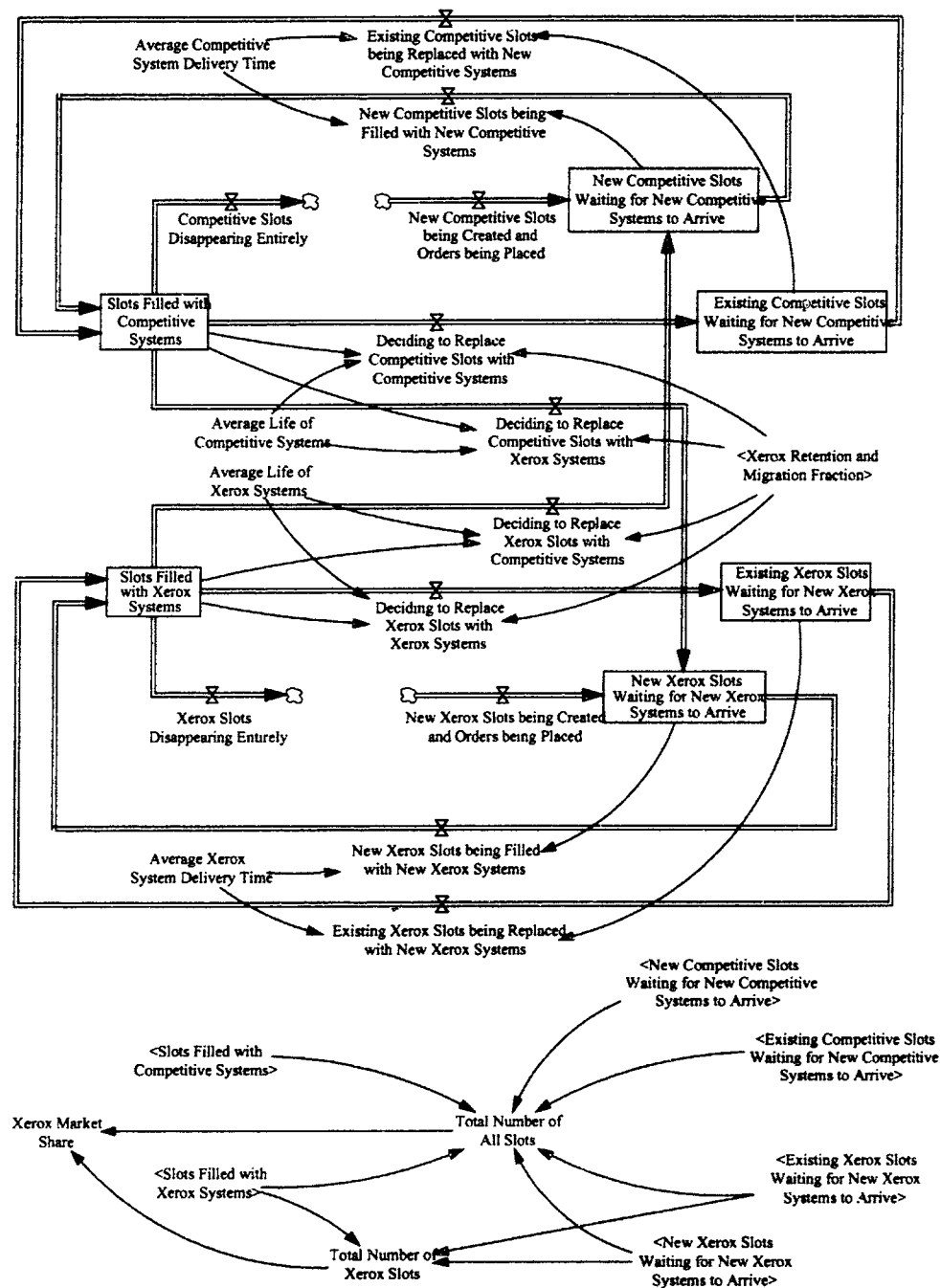


Figure 12: Model View – Market Dynamics in terms of Slots



This structure consists of two sets of identical loops – one for Xerox slots and one for competitive slots. Within each there are three stocks. The first is for slots currently filled with a system (i.e. a machine – although I intentionally use the term “system” to try to imply that some fraction of the products in the marketplace are partially or even entirely software-based). Exiting this stock a slot can either be reclassified as one that disappears (this flow has been set to zero) or one that stays in the model. In this latter case, the slot can either remain occupied by a system from the same vendor or it instead can be replaced with a system from the other vendor. These two flows lead to the other two stocks within each set of loops – one for an existing slot for a vendor waiting for a new system from that vendor to be delivered and the other for a slot that is new to the other vendor waiting for a new system from that vendor to be delivered. Note that the latter stock has a flow into it for brand new slots being created but, as mentioned earlier, this is set to zero in all cases.

There are two sets of time constants in this portion of the model. The first concerns how long it takes, on average, for a vendor to deliver a new system once it has been ordered. For simplicity, and since I did not focus on this variable in my research, I have set this time constant equal to the same value for both vendors. Based on my own experience, I use a value of one month, although it should be recognized that this is a rough guess. The other pair of time constants in this view concerns how long a system lasts in the field before a customer decides to replace it. Again, my research focus was not on this particular parameter but, based on my own experience in the industry (in particular, as a product development engineer for whom this information is important since it affects design decisions), I have chosen four years (48 months) for this variable for both vendors. Shortly, however, I will analyze the effects of not using the same value for each vendor.

The single most important variable in this view – and in fact in the entire model – is what I call the “Xerox Retention and Migration Fraction.” This is the key variable that reflects the purchasing decisions made by the customers in the field. All factors in the rest of the model ultimately contribute to determining what the value of this variable is. As I have the model structured, this variable is a fraction that determines how many customers deciding to replace a system end up doing so with a Xerox system. This particular structure inherently makes one very important assumption. Namely, that all customers have equal knowledge of all aspects of both vendors so that they can make an informed choice between them. This assumption somewhat follows from the one mentioned earlier that there are a fixed number of slots in the world of the model. More specifically, the way that earlier assumption is modeled (with no flow of slots into or out of the model) inherently implies that all slots in the world of the model are pre-existing. In equilibrium and on long-term average, sufficient “mixing” (i.e. switching back and forth between vendors for each slot) will occur in this structure so that this assumption is met. When one considers that many larger Xerox customers have equipment from multiple vendors, this assumption is probably fairly realistic.

To explore the dynamics of this section of the model I set all time constants to the values mentioned above and set the retention and migration fraction (“XRMF”) equal to 0.5. I then inserted a total of 1,000 slots into the model and ran the model sufficiently long to let the values in the stocks come to their equilibrium values. I then plugged these values into the model as initial values for the stocks. Re-running the model at this point yielded Run 1 that, as might be expected, shows the Xerox market share remaining steady at 50%.

I next ran the model with identical conditions except that at month six I used the STEP function to lower the XRMF from 0.5 down to 0.25. This was Run 2. The results of the first two runs follow below. Note that they extend through year 20 (month 240).

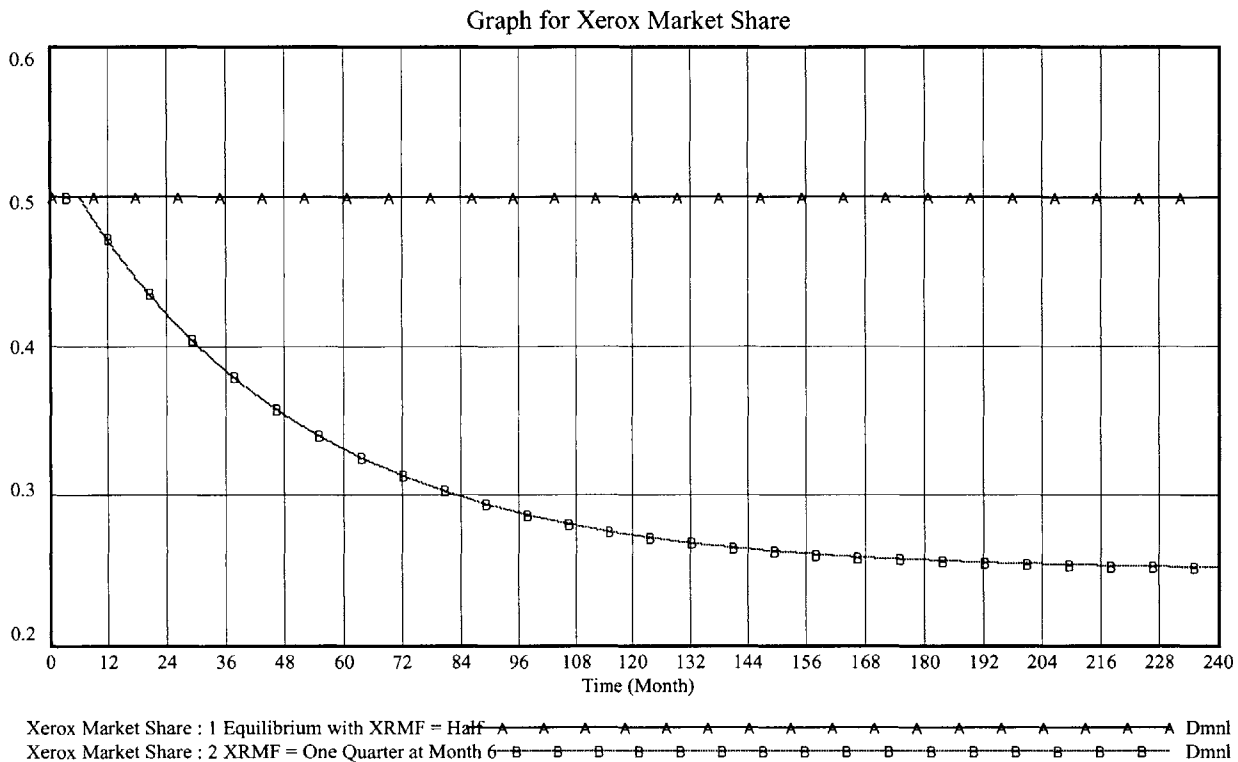


Figure 13: Market Share Dynamics with Different XRMF Values

As the graph shows, the Xerox market share for Run 2 eventually asymptotes at a value of 0.25. This demonstrates the point that, with all else being equal between Xerox and the competition and a stable value for the XRMF, the value of the XRMF is equivalent to the ultimate equilibrium value for Xerox' market share. This is perhaps intuitive from the structure.

I next wanted to explore the effects of altering the average life of a vendor's equipment in the field. Run 3, shown at the top of the next page, is identical to Run 1 except that at month six the average life of Xerox systems in the field is increased from four years to six years (a 50% increase in life). This run shows that all else being equal (in particular, with the same XRMF – i.e. the same fraction of customers choosing one vendor over the other), an increase in the average life of that vendor's systems leads to a *higher* equilibrium market share than the value of the retention fraction. This is because since those systems have a longer life, they come up for replacement less often, thereby not giving the other vendor a chance to take ownership of that slot. Following this run, I simultaneously combined both effects from Runs 2 and 3 to yield Run 4. In other words, at month six the XRMF is reduced by a factor of one half and the Xerox system life is increased by 50%. This run is also shown in the next figure.





Each of the three key variables are scaled so that when they are at their normal levels (i.e. those existing at the start of the model – the beginning of 1998) they have the numeric value of one (in the case of Xerox) and something else (in the case of the competition – more on this below). Then, depending on everything else that happens in the model, the variables take on new values that can range from zero to roughly two. Values above the normal value indicate a more favorable (for that vendor) situation, i.e. one that results in raising their retention and migration fraction, and values below one indicate a less favorable situation. In general, the values for these variables stay in the vicinity of one. Each of the three variables are then multiplied, not added, to yield the “combined” value for each vendor. In structuring the model this way, if one variable is particularly extreme, it cannot as easily be compensated for by the value of the other two variables. For instance, say a customer was extremely dissatisfied with their “other factors” experience with their vendor. In this case, even if the vendor’s sales force was the best in the world and the customer thought their products were fantastic, they may still not want to do business with that vendor. This structure attempts to replicate this decision-making process.

With both combined values calculated, they are then added to form a total. The Xerox Retention and Migration Fraction is then computed by taking the ratio of the Xerox combined value to the total value. Note also that I have a small structure here that uses the `SAMPLE IF TRUE` function to take a “snapshot” of the XRMF at the start of the earliest occurring of the two reorganizations. This snapshot will be used later.

In the case of the normal value for the competition’s variables, what I wanted was a value that, when combined with the normal value of one for the Xerox variables, would yield the initial value of the XRMF that I desired (i.e. 0.3). Given the structure of the model, and letting this value be  $x$ , the relationship governing this is the following (note that the “1” that appears twice is the product of the three normal Xerox variable values which are all equal to one):

$$InitialXRMF = \frac{1}{1 + x^3}$$

From this it can be shown that:

$$x = \sqrt[3]{\frac{1}{InitialXRMF} - 1}$$

For  $InitialXRMF = 0.3$  this yields  $x = 1.326$ . It should be noted that Vensim does not have a cube root function. So, to achieve a cube root in the model, I resorted to exponential and natural logarithmic functions. Starting with:

$$x = y^3$$

It can be shown that  $y$  can be solved for as follows:

$$y = e^{\frac{1}{3} \ln(x)}$$

This is the actual function used in the Vensim model. Finally, it should be noted that since this value remains fixed and there are no competitive variable dynamics modeled, the entire remainder of the document and model is in reference to Xerox.

## 7. Sales Force Effectiveness

### 7.1 Discussion

The fundamental premise I make in the determination of sales force effectiveness is that it is composed of three key factors, all of which are described in subsequent sections of this document. One factor relates to the fraction of Xerox sales reps that are unfamiliar with their customers. Another relates to the fraction of all Xerox sales reps covering single industries. And the third deals with the fraction of their time that Xerox sales reps actually spend selling.

### 7.2 Description and Analysis of this Subsection of the Model

For each of these three factors the structure is the same. Specifically, the ratio of the current actual value of the variable to its “snapshot” value (taken at the start of either the sales force reorganization – in the case of selling time – or at the start of the earliest of the two reorganizations – in the case of the other two factors) is computed. The value of this ratio is then used as the input to a lookup table which generates the effect of each ratio on sales force effectiveness. Similarly to the structure and calculations made in the computation of the XRMF, the effect of each of these factors is set equal to one all the way up until when the snapshot is taken. These three effects are then multiplied to compute the total sales force effectiveness.

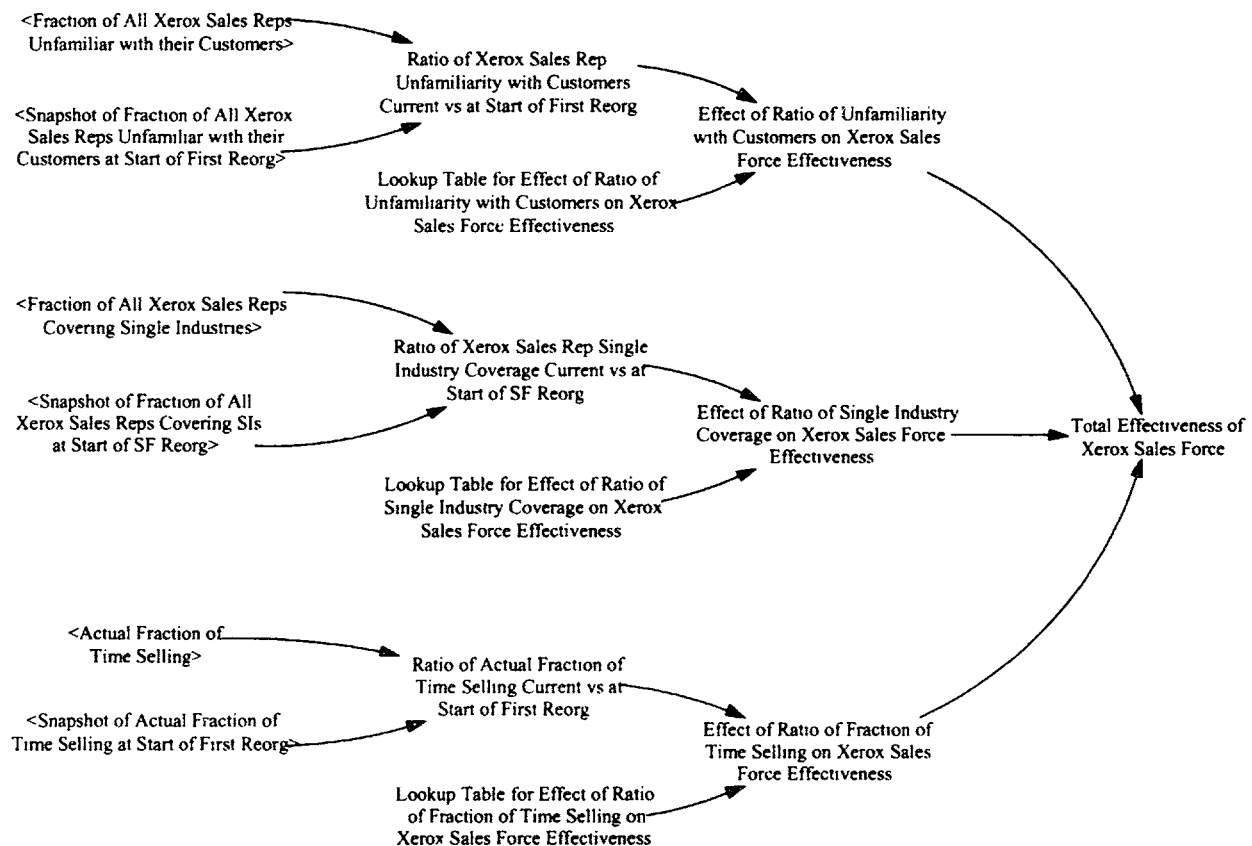


Figure 16: Model View – Sales Force Effectiveness

In this structure the profile of the lookup tables is extremely important. Consider first the ratio involving the fraction of all Xerox sales reps that are unfamiliar with their customers. As this ratio rises above one, the effect on the sales force effectiveness needs to fall below one, and as the ratio dips below one, the effect needs to rise above one. This is because I am postulating that the more sales reps are unfamiliar with their customers, the less effective they will be since they will not be as well acquainted with their customer's industry, their business, and their needs. I additionally posit that the effect is slightly non-linear in such a way that as the level of unfamiliarity rises, the negative effect on sales force effectiveness increases less and less, and as the level of unfamiliarity falls, the effect decreases less and less. This is because I believe that there is a slight "diminishing returns" dynamic at work – in other words, beyond a certain point it doesn't matter how much larger (or smaller) a fraction of the sales force is unfamiliar with their customers – most of the variability is centered around the nominal value. To construct this lookup table I determined extreme values and fitted the appropriately shaped curve in between. So, when the ratio is zero, meaning that all sales reps are familiar with their customers, I figured that the maximum boost to sales force effectiveness this could have was 20%. At the other extreme the ratio is unbounded since the denominator – the fraction of unfamiliarity at the start of the first reorganization – could approach zero. In fact, it could actually be zero, but to cover this case I have an IF THEN ELSE statement in the ratio calculation that defaults the value to one. Realistically speaking, and given my exercising of the model over a number of different scenarios, I figured that the maximum value this ratio would ever possibly attain under even somewhat unrealistic conditions would be five. At this extreme, I eventually determined that the effect on sales force effectiveness should be a reduction of about 80%. And, clearly, at one the effect must similarly be one. The resulting lookup table appears below.

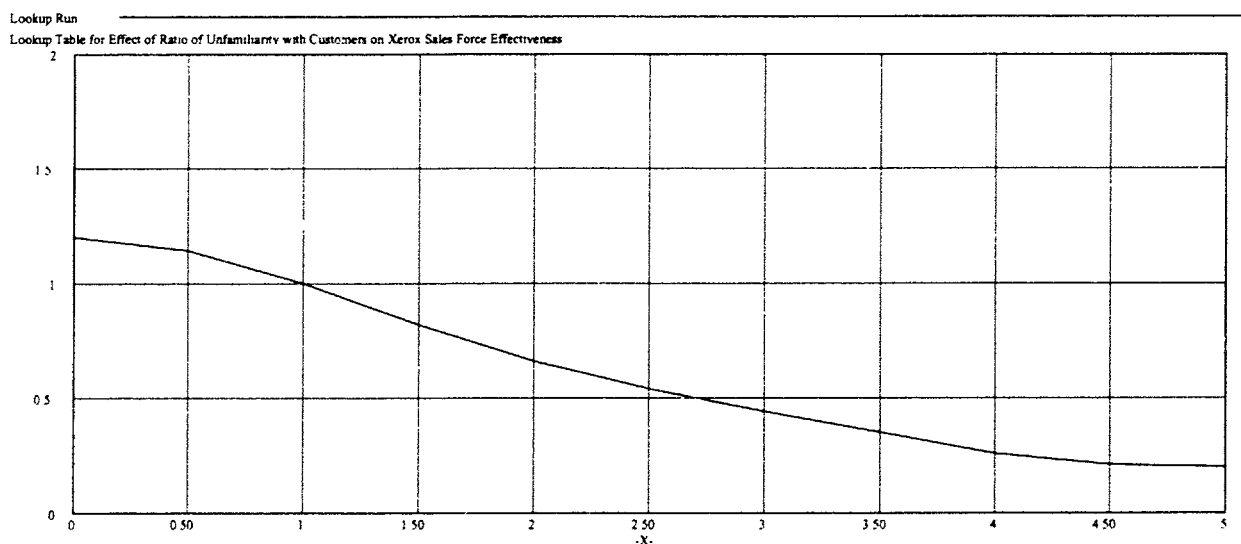


Figure 17: Lookup Table for Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness

The next ratio effect to consider is the one involving the fraction of Xerox sales reps covering just single industries. The entire postulate of the sales force reorganization was that as this ratio goes up – i.e. as a larger fraction of the sales force is dedicated to a single industry – sales force

effectiveness should also go up. However, this is another case of diminishing returns. As for extreme values, when the ratio is zero, meaning that no sales reps are covering single industries, then sales force effectiveness would not go to zero – some sales would still be made – but it would be reduced from normal. At this extreme I have assumed a value of 60% effectivity. At the other extreme, under realistic values for all relevant parameters, I expect that this ratio will never exceed three, and at that value I expect that the effect should be no more than about 15%.

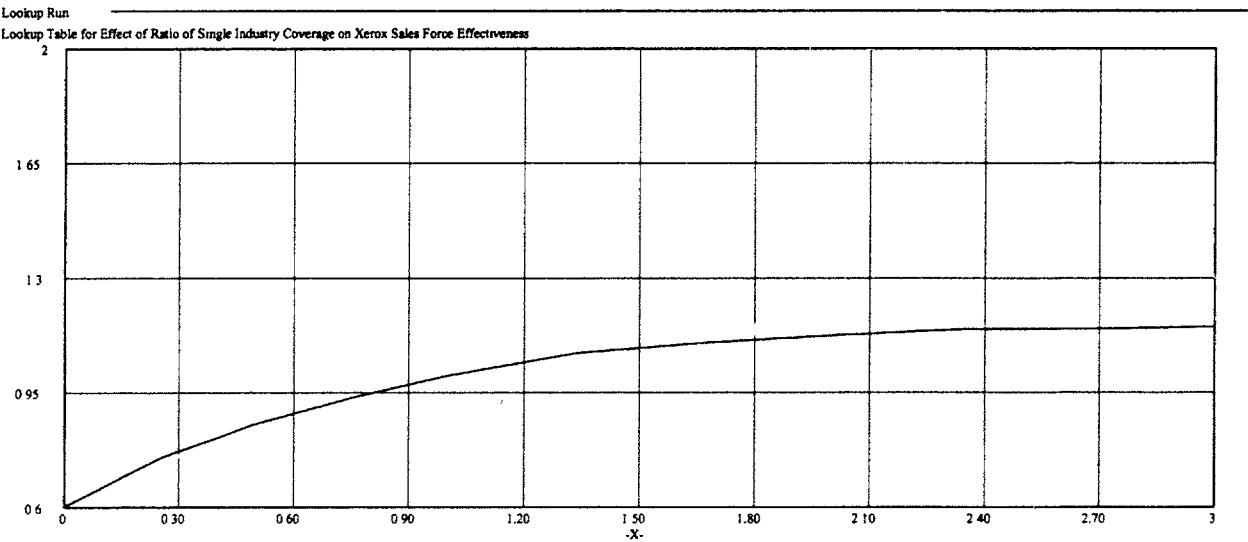


Figure 18: Lookup Table for Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness

The final ratio effect to consider here is the one involving the fraction of time that Xerox sales reps actually spend selling. Obviously, as this ratio goes up – i.e. as sales reps spend more of their time selling – sales force effectiveness should also go up. However, this is yet another case of diminishing returns. As for extreme values, when the ratio is zero, meaning that sales reps are spending none of their time selling, then sales force effectiveness should also be zero. At the other extreme, under realistic values for all relevant parameters, I expect that this ratio will never exceed two. It is difficult to say precisely how much more effective the sales force should be if they can spend double their normal amount of time selling but certainly I believe that it will not be a doubling of effectiveness. At this extreme I ended up settling on a value equivalent to an increase in sales force effectiveness of about 50%. The custom function described earlier, with a parameter of  $a = 2.0$ , ended up yielding this. The table appears on the next page.



Lookup Run

Lookup Table for Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness

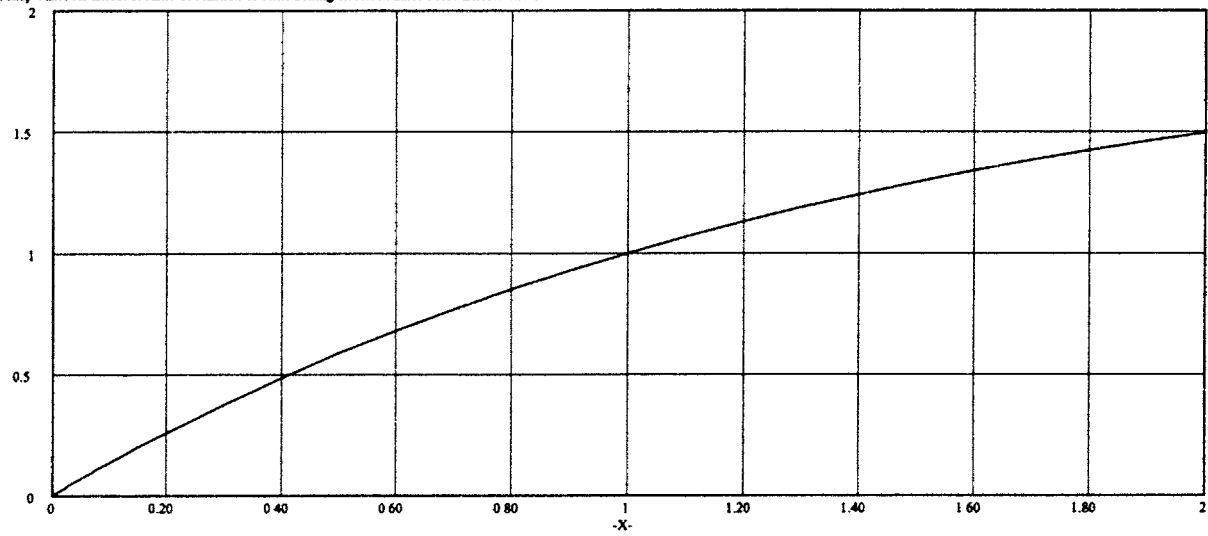


Figure 19: Lookup Table for Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness

## **8. Sales Force Industry Coverage Reorganization**

### **8.1 Discussion**

As pointed out in a multitude of the citations earlier in this document, the prime goal of the sales force reorganization was to put a higher fraction of the sales force in assignments where they were covering single industries. This, the reasoning went, would allow them to become specialists within that industry and thereby be more successful at selling industry-specific “solutions.” Given this, it was imperative in modeling this that I tracked the fraction of sales reps covering single industries. To be as simple as possible, I divided the world of sales reps into those covering single industries vs. those covering multiple industries. In reality, the latter category is made up of reps covering two, three, four, and even more industries. However, I did not deem the added complexity of incorporating this worth the added insight it might have provided.

The other key sales rep attribute that I believed was necessary to incorporate simultaneously – and one to which I saw scant attention paid by senior management in all of the research I did (at least before the sales force reorganization began to be blamed for Xerox’ decline) – was the degree of familiarity a sales rep had with their customers. In other words, regardless of industry association, there is still a key element of the effectiveness of a sales rep that is ultimately driven by how familiar they are with their customer. Again, in the interest of being simple, I created an aging chain with just two stages in which a rep was either unfamiliar or familiar with their customers.

Combining these two sets of two-level classifications required having four stocks and these four form the heart of this section of the model, as will be seen below.

### **8.2 Description and Analysis of this Subsection of the Model**

There are two key outputs from this section of the model, both calculated from the four stocks. One is the fraction of sales reps unfamiliar with their customers and the other is the fraction of sales reps covering single industries. The four stocks in this section of the model are linked by a series of internal connecting flows and have a number of flows entering and exiting them across the model boundary. The internal connecting flows represent the reassignment of reps. It is absolutely critical to note that *any time a rep is reassigned, they always end up in the condition of being unfamiliar with their customers*. The inherent structure of the model here ensures that this is the case. This is the key lesson that it appeared Xerox had learned following the 1995 sales force reorganization but then seemed to forget midway through its implementation of the 1999 reorganization.

The flow of reps entering the system represents hiring and is structured so that all new reps coming in are placed in the category of being unfamiliar with their customers. The flow of reps leaving the system represents attrition. This includes normal attrition (people retiring, a normal level of people deciding to leave Xerox, etc.) and also the effects of heightened attrition (i.e. defections) as a result of a number of factors described in a later section of this document.

Almost everything else in this section of the model consists of structures that determine the hiring, reassignment, and attrition rates. The view follows and the discussion of it will continue.

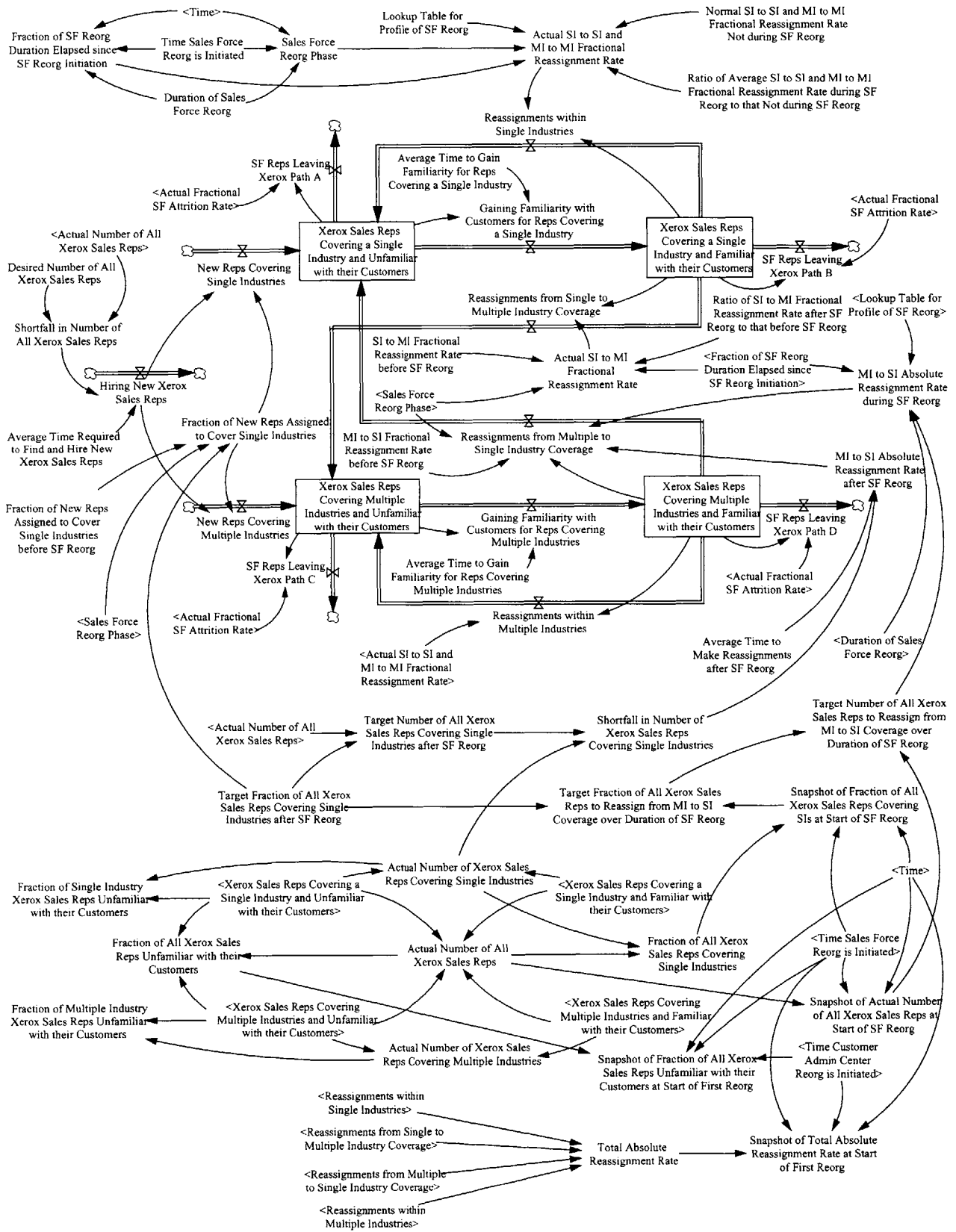


Figure 20: Model View – Sales Force Industry Coverage Reorganization

Hiring is modeled as a simple goal-seeking system. Note that since the ultimate effects of the dynamics of this section are based on ratios between the values of the stocks, the absolute number of reps in the system is not important. Nevertheless, I've used as the desired number of reps the value of 4,500 as cited in the reference in footnote 2. Furthermore, I have assumed a four month average time to find and hire new reps. I do not have any hard data to back this up other than my own experience within Xerox observing the process of trying to hire external people. This flow of new hires is split between those going to cover a single industry and those going to cover multiple industries. Speaking probably in the second quarter of 1999, Tom Dolan, then Senior Vice President and President of Xerox' North American Solutions Group (the North American division of the Industry Solutions Operations group), had the following figures attributed to him:

Currently about 40 percent of the sales force is organized this way [i.e. by vertical industries], and Dolan would like that figure to reach 75 or 80 percent.<sup>89</sup>

Given this, I have used 40% as the fraction of new reps being assigned to cover single industries before the sales force reorganization and I have used 75% as the target fraction of all reps covering single industries after the sales force reorganization. Both of these are input parameters to this section of the model. In the interest of simplicity, at the time the sales force reorganization is initiated the fraction of new reps being assigned single industry coverage jumps from the before (40%) to after (75%) fraction. Note that I have a  $\text{MAX}(0, \text{calculated hiring rate})$  function factored in so that if the calculated hiring rate were to ever go negative, actual hiring would bottom out at zero (in other words, negative hiring is not allowed here – that is attrition accounted for elsewhere).

At the outflow side, attrition is modeled as first-order decay governed by a fractional attrition rate. This rate is applied to the attrition outflow from all four stocks. See the next section of this document for a further discussion of the calculation of this parameter. Note that the structure of the attrition rate calculation includes first-order feedback such that it can never be below zero, as required.

Within the system the discussion of the rates gets a little more complicated. Consider first the two "gaining familiarity" flows. These are simple first-order delays with average delay times representing the average time it takes for a rep to gain familiarity with a customer. Based on my conversations with Xerox sales reps, these delay times vary greatly and depend on the customer's business and the complexity of the products they are considering purchasing. From these conversations I have decided to use a "gaining familiarity" time for reps covering single industries of eight months. For reps covering multiple industries, I reason that since they are covering multiple industries their available time is by definition split between different industries and thus, in terms of calendar (i.e. model simulation) time, on average it will take them longer to become familiar with their customers. However, I do not think this effect is particularly severe and so I have chosen a value of 10 months for this parameter.

Next consider the fractional reassignment rate within single industries and within multiple industries ("SI to SI and MI to MI"). Both before and after the sales force reorganization this is the same value. Hard data for this parameter was not to be found. However, based again on my discussions with Xerox sales people, I made the rough assumption that in normal times roughly

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<sup>89</sup> Same as footnote 2.

20% of the sales force would be reassigned customers over the course of a year (this accounting primarily for new customers having to be covered). This converts to about 0.017/month. Considering the chosen value for the normal attrition rate (0.01/month; see next section of this document), this figure seems to be in the right order of magnitude. During the course of the actual sales force reorganization there are two things that determine this reassignment rate. First, there is a ratio which expresses how much higher on average this reassignment rate is during the reorganization. Again, hard data is difficult to come by but based on the amount of churn that it appears must have happened in the field, I chose a value of 2 for this parameter. The other key factor – which is used elsewhere as well – is the actual profile of the reorganization. In other words, over the course of the reorganization, were all reassignments done evenly or were they done in some other fashion? To institute different profiles I use lookup tables. What they express is, as a function of the fraction of the duration of the reorganization that has elapsed, how much of the average level of reassignment occurs. As such, these lookup tables must have an area under their curves of one (otherwise, the total average effect would be different than that desired). The values in these lookup tables meet this criteria, something I have enforced by computing their areas in a spreadsheet and, when necessary, tweaking the profiles slightly (by using the solver) so that the area summed to one. The simplest profile is a straight line with a value of one that would represent a constant, even implementation of the reorganization. I have not bothered to show this profile. However, based on the information cited earlier from footnote 3, it appears that the profile of the reorganization was relatively slow up to September of 1999 (i.e. through a little more than half-way) and then must have been higher after that. To simulate this I created the following profile.

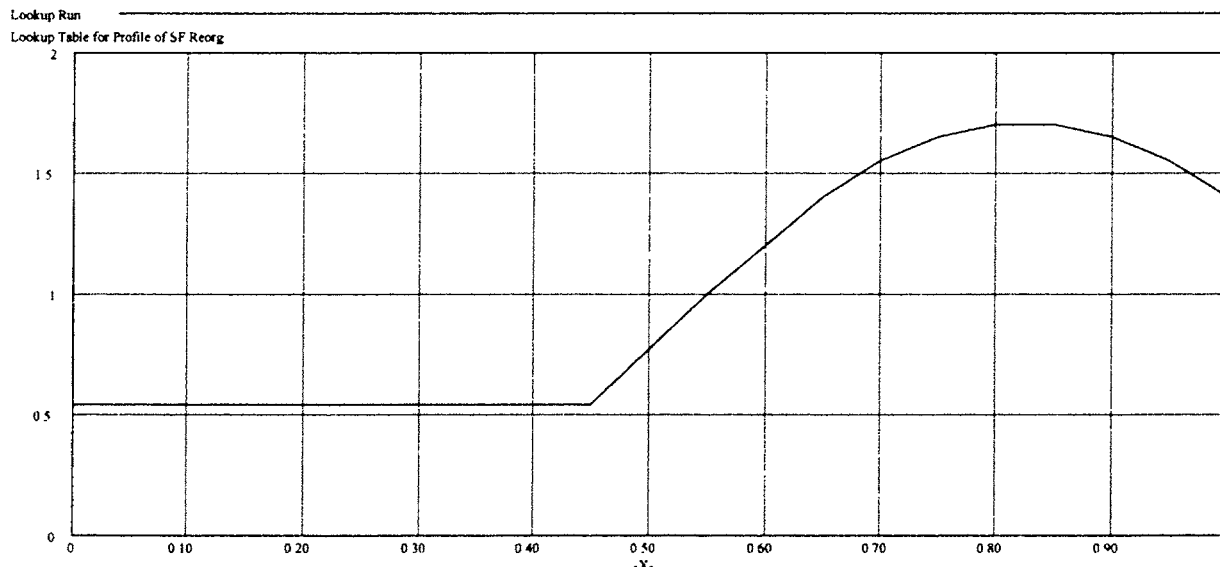


Figure 21: Lookup Table for Profile of Sales Force Reorganization - Actual

Note that given all of the history of this reorganization already cited, its initiation time is modeled as happening at the start of month 12 (i.e. the beginning of 1999) and its duration is 12 months.

The fractional reassignment rate from single industry to multiple industry coverage is broken into three parts. Before the sales force reorganization I make the assumption that the fractional reassignment rate is about half of the rate within industry coverage (which is the 0.017/month rate) and thus I use 0.008/month. After the sales force reorganization I make the assumption that management does not want people being reassigned in this manner nearly as much and thus the fractional rate then is half of what it was before the reorganization. Finally, during the reorganization itself I linearly change the fractional reassignment rate between the before and after values as a function of the fraction of the reorganization that has elapsed.

Finally, the reassignment rate from multiple to single industry coverage is similarly broken into three parts. Before the sales force reorganization I again use a value approximately equal to half of the within industry rate and so I use 0.008/month. However, both during and after the reorganization I end up computing an absolute reassignment rate (i.e. measured in reps/month). At the start of the reorganization I take a snapshot of the actual fraction of sales reps covering single industries. The difference between this fraction and the desired, post-reorganization fraction of reps management wants assigned to single industry coverage (i.e. the 75% figure cited earlier) yields the target fraction of reps to reassign during the reorganization. This fraction is then multiplied by the snapshot of the total number of reps with Xerox at the start of the reorganization to yield the total absolute number of reps to move from multiple industry coverage to single industry coverage. This total is then divided by the duration of the sales force reorganization to arrive at an average absolute reassignment rate. Finally, this average value is modulated by the profile of the reorganization described earlier. Note that here I use a  $\text{MAX}(0, \text{calculated absolute reassignment rate})$  formulation so as to ensure that this flow never goes negative. It may not be the most elegant formulation, but under all but the most unrealistically extreme scenarios it never comes into play anyway. After the reorganization is complete a simple first-order goal-seeking structure is used to control the MI to SI reassignment rate and in it I assume an average reassignment time of two months.

With the parameter values described above, I initialized this section of the model to equilibrium (this was captured in Run 5). One thing to note is that in equilibrium, the total number of Xerox sales reps comes to about 4,326 which is shy of the target value of 4,500. The relationship between the normal fractional attrition rate (0.01/month) and the length of time it takes to find and hire new sales reps (4 months) is such that the attrition rate always keeps just enough ahead of the hiring rate that the hiring can never quite rise enough to allow the desired number of reps to be met. This can be calculated as follows. The equilibrium equation is

$$\text{Hiring Rate} = \text{Attrition Rate}$$

Which implies

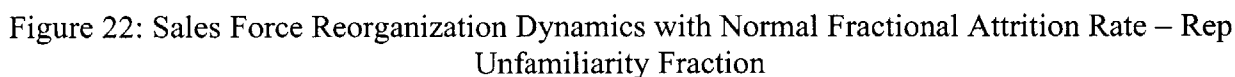
$$\frac{\text{DesiredNumReps} - \text{ActualNumReps}}{\text{HireTime}} = \text{ActualNumReps} * \text{AttritionRate}$$

Which can be solved for *ActualNumReps* to yield

$$\text{ActualNumReps} = \frac{\text{DesiredNumReps}}{1 + (\text{HireTime} * \text{AttritionRate})}$$

Plugging in the values above does in fact yield 4,326. The significance of this is that if even in equilibrium, when there are no extra pressures for the attrition rate to rise (as there are when the

To further study the dynamics of just this part of the model I invoked the sales force reorganization. However, I maintained the attrition rate at its normal value. Run 6 is this section of the model run with the linear reorganization profile and Run 7 is this section of the model run with the “actual” profile of the reorganization. Here is the behavior for the fraction of all sales reps that are unfamiliar with their customers.



The next graph concerns the behavior for the fraction of sales reps covering single industries.





## **9. Sales Force Attrition Rate**

### **9.1 Discussion**

Another key premise of this thesis, and one that should be clear from many of the earlier references, is that the attrition rate of the sales force went up significantly during and as a consequence of the sales force reorganization. I also believe that in addition to these endogenous effects there were also exogenous effects at work. Most notably, and as will be detailed below, what I term the “state of the world outside of Xerox” is something that I include in the determination of the attrition rate. The intent here is to account for the fact that during much of the time Xerox was struggling the rest of the economy was booming and thus the incentive to leave Xerox was higher than it would have been had this not been the case.

In terms of actual attrition values, the following excerpt from The Wall Street Journal from May of 2000 provides some insight:

Chuck Otto, who headed Xerox’s field operations until retiring in 1993, says many sales reps grew frustrated learning about new industries and left the company. He also says the Xerox sales force has grown demoralized because reps aren’t meeting their sales target numbers, which affects compensation.

Mr. Otto says the U.S. sales-force turnover rate reached about 25% a year about 12 to 18 months ago, which he says was about twice the turnover rate when he left Xerox.<sup>90</sup>

Roughly speaking, if the annual maximum attrition rate reached 25%, then by dividing this by twelve one reaches the approximate equivalent fractional monthly rate of 0.021/month. Dividing this by two to get to the normal rate yields about 0.01/month. This latter value is what is used in the model for the normal fractional attrition rate.

### **9.2 Description and Analysis of this Subsection of the Model**

The overall structure of this section of the model is one in which two “state measurements” – one reflecting the internally perceived state of Xerox and the other reflecting the internally perceived state of the world outside of Xerox – are used to modulate the normal attrition rate. Through the use of one lookup table, both state measurements are transformed into effects that drive the “implied” cumulative effect of these states on the attrition rate. However, I have incorporated a simple stock structure to capture the “actual” (as opposed to “implied”) cumulative effect because I make the assumption that there is a delay time between when either of these states change and when sales reps within Xerox can actually react to the changes. I have also postulated here that the delay time is different depending on whether the implied cumulative effect is greater than or less than the current actual cumulative effect. If the implied effect is greater than the actual effect, a situation which wants to drive the attrition rate up, then I reason that there is a longer delay involved than if it were the other way around. This is because people in general do not instantly decided to leave their jobs if the grass looks greener elsewhere – they spend time getting their resume in order, looking for their new job, and making decisions – all before they actually leave their current organization. I have used a value of three months for this

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<sup>90</sup> “Xerox’s New Leadership Vows to Boost Firm’s Morale, but Will Stick to Cutbacks.” Auerbach, Jon G. and Lublin, Joann S., *The Wall Street Journal*, May 15, 2000, p. A4.

average delay time. Going in the other direction, meaning Xerox looks to be more attractive than elsewhere, I have a very short delay time since it is easier and faster to decide to stay than to actually leave. For this time constant I have used one-quarter of a month (roughly a week).

The structure of this section of the model follows.

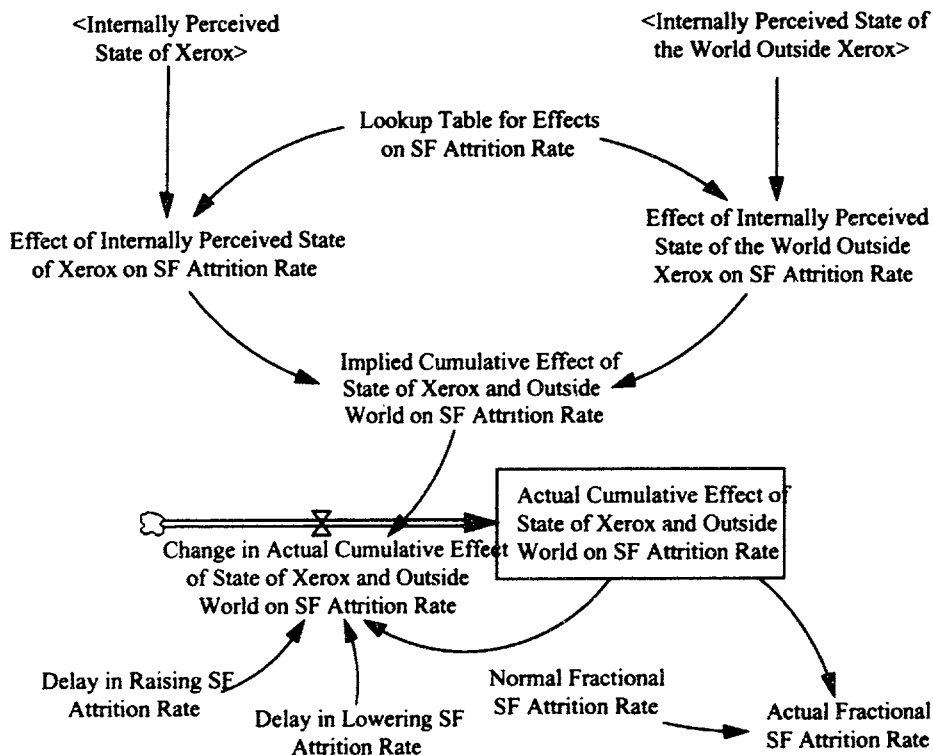


Figure 24: Model View – Sales Force Attrition Rate

The two “state” measurements are described more fully in the next section. However, the way I have defined them, their interpretation is that as each variable goes up, that particular domain (i.e. Xerox or the world outside of Xerox) has a higher attractiveness. The way I have scaled them a value of one is again a nominal value and the range expected is from zero to about three. Based on this, I again utilized my custom function for the lookup table, this time with the parameter  $a = 1.0$  which yields a maximum effect (with an input of three) of about a 50% increase over nominal. The table is shown on the top of the next page. This lookup table works fine for the internally perceived state of the world outside of Xerox since as this goes up, the effect on the attrition rate likewise should go up (i.e. the more the attractiveness of the outside world goes up, the more the attrition rate goes up). In the case of the internally perceived state of Xerox however, one wants the opposite effect. In other words, as Xerox becomes more attractive, one wants the attrition rate to go down. I decided that the simplest way to model this was to use the same lookup table but for the input to the table I take the value three (the maximum value in the lookup table) and subtract from it the value of the internally perceived state of Xerox. This has the effect of flipping the lookup table about a vertical axis. Finally,

note that the actual fractional attrition rate is the product of the normal fractional attrition rate and the actual cumulative effect.

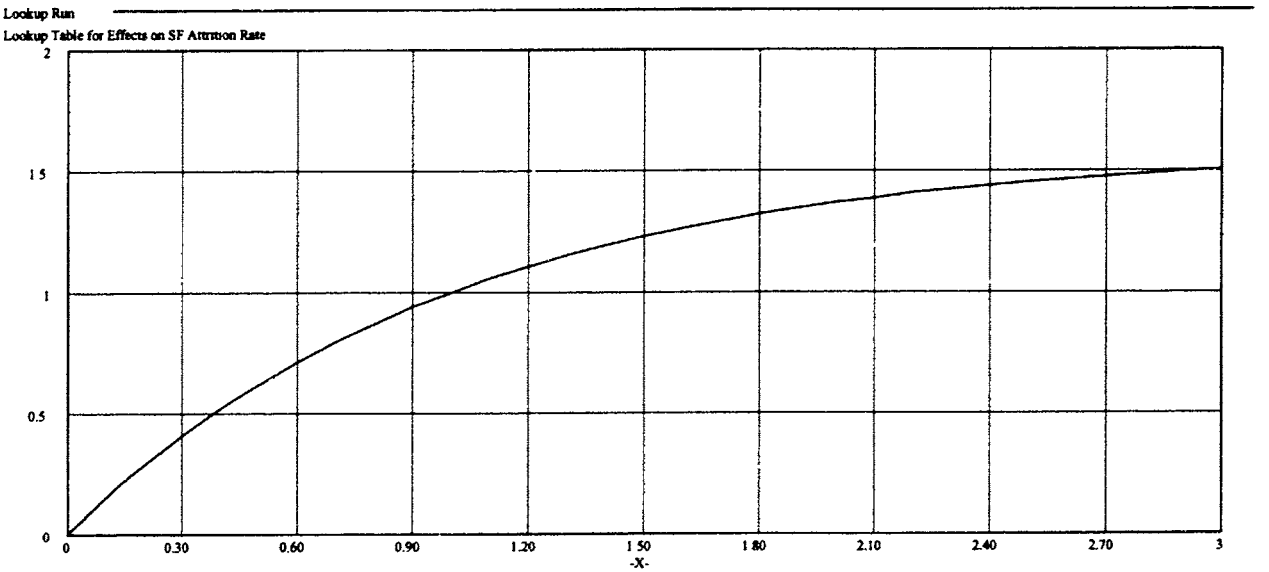


Figure 25: Lookup Table for Effects on Sales Force Attrition Rate

## 10. State of Xerox and the World Outside of Xerox

### 10.1 Discussion

As mentioned before, part of the philosophy of the model is that Xerox sales reps base their actions with regards to staying with Xerox or not on a combination of their perceptions of both the state of Xerox internally and the state of the world outside of Xerox. Although certainly many factors contribute to both, I have taken as simple of an approach as possible. In the case of the internally perceived state of Xerox, I assume that two factors make up this perception. One is the Xerox Retention and Migration Fraction. I use this as input here because it strikes me as a decent surrogate for how well Xerox is doing as a company. This is a key relationship assumption in the entire model. The other factor concerns the total absolute sales rep reassignment rate. The thinking here is that the more reassignments the sales reps see, the more likely they will be to think that Xerox is in a state of turmoil and is therefore not as attractive. For the external world, I use a very simplistic measure of the performance of the stock markets as a surrogate for how attractive the world is beyond Xerox.

### 10.2 Description and Analysis of this Subsection of the Model

The structure I have devised is as follows.

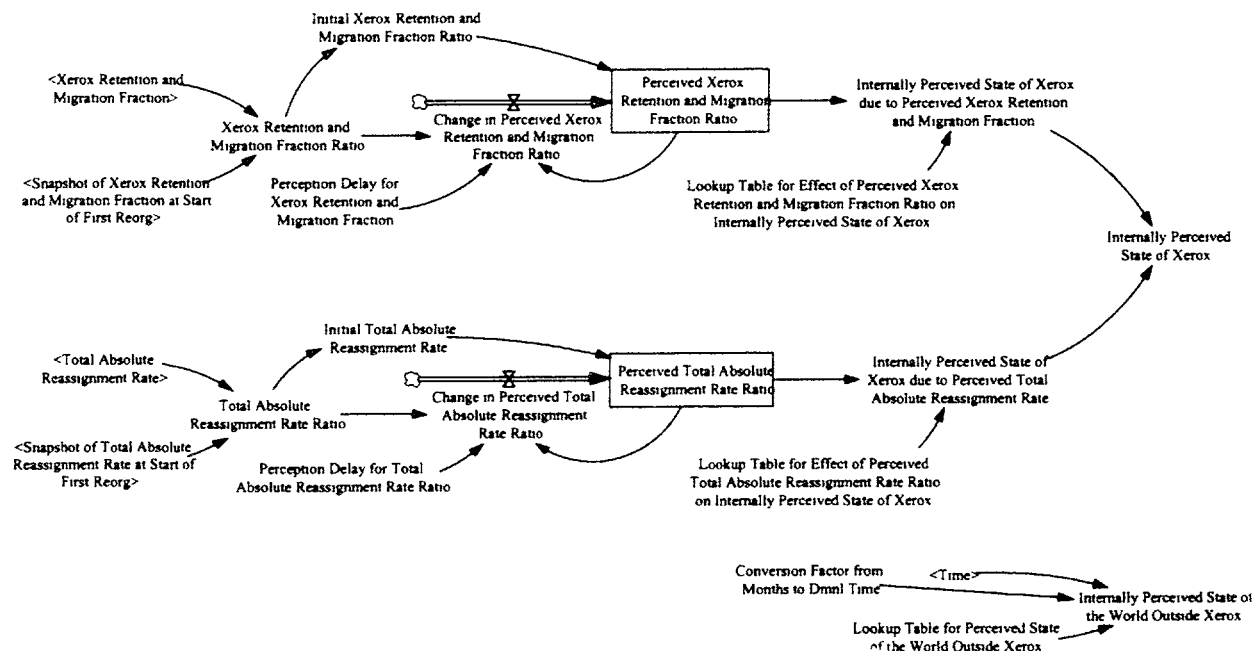


Figure 26: Model View – State of Xerox and the World Outside of Xerox

For the two factors affecting the internally perceived state of Xerox the structure is the same. I take a snapshot of the relevant variable at the start of the earliest reorganization and then use it, in combination with the current actual value of the variable, to compute a ratio. This ratio represents the instantaneous actual state of that variable relative to its nominal level (and

therefore a value of one means that it is no different than it was when the first reorganization started). However, I posit that there is a perception delay that represents how long it takes a sales rep to actually become aware of the current level of the variable. In both cases I use an average delay time of one month, figuring that since the sales force operates to monthly targets, they are probably getting together with their peers and/or management and seeing the latest picture of what is going on internally about once a month. Once the actual ratio has been converted into a perceived ratio I use lookup tables to convert the perceived ratio into the effect on the internally perceived state of Xerox. The two lookup tables are as follows.

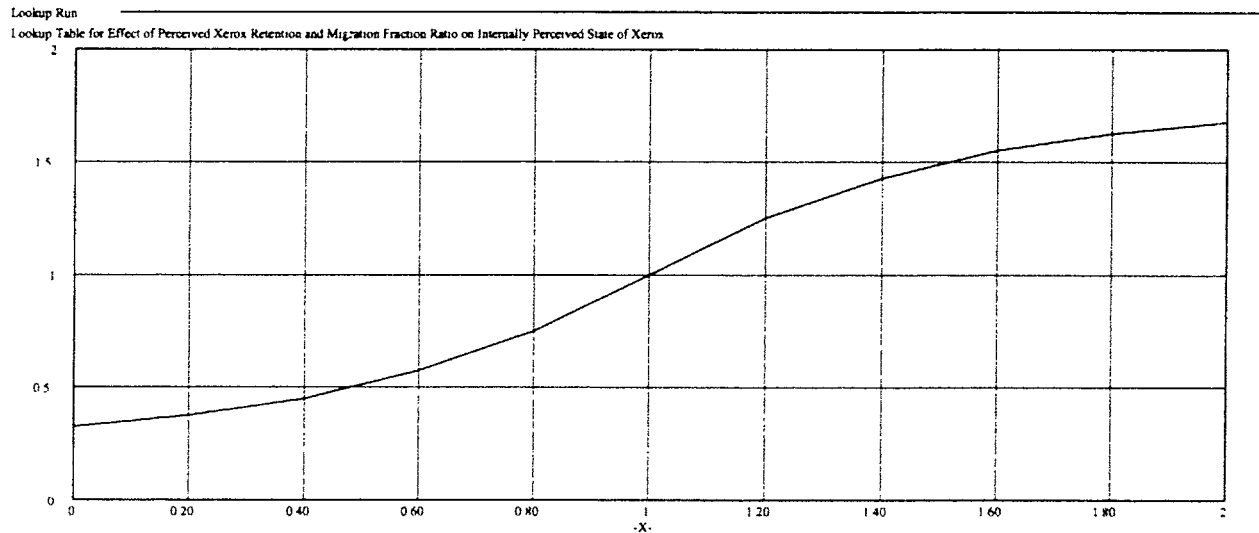


Figure 27: Lookup Table for Effect of Perceived Xerox Retention and Migration Fraction Ratio on Internally Perceived State of Xerox

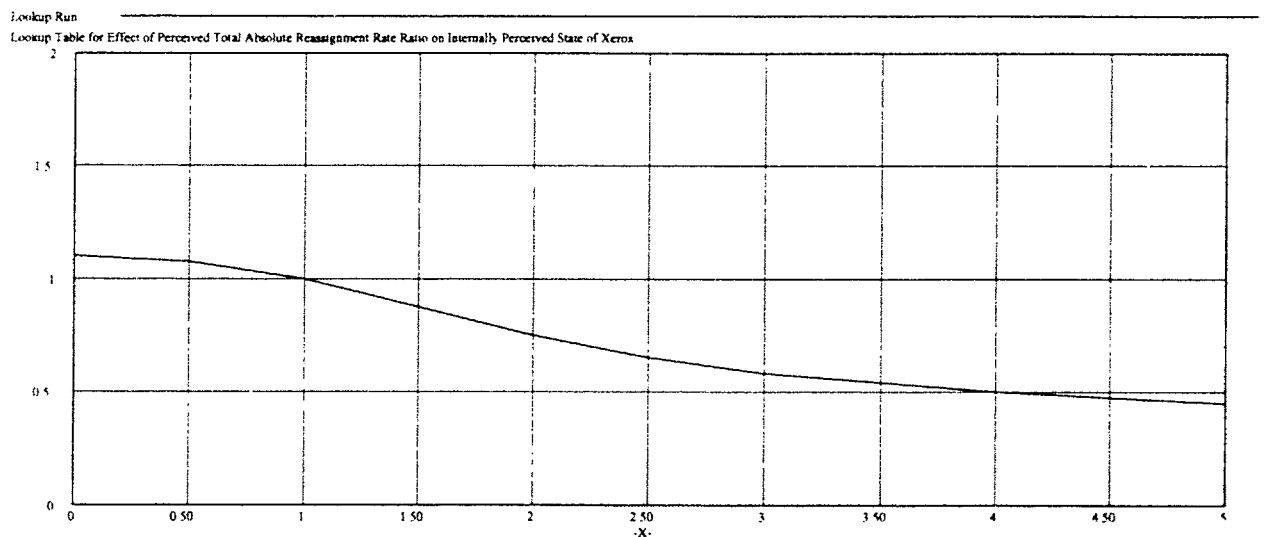


Figure 28: Lookup Table for Effect of Perceived Total Absolute Reassignment Rate Ratio on Internally Perceived State of Xerox

The shape of the first lookup table can be explained by considering that a sales rep's compensation is tied very highly to how well they sell. If they are meeting or exceeding their targets, they are compensated handsomely. So, if Xerox overall is selling well (i.e. the XRMF ratio is higher than one), then the internally perceived state of Xerox should be higher since sales reps would see Xerox as a more lucrative place to stay. On the other hand, if they are not selling well, then they are more likely to perceive Xerox in a more negative light. This effect lookup table is the steepest in the entire model and this is intentionally so – I am trying to capture the motivating and de-motivating effects of how well Xerox is selling on the sales reps' perception of Xerox.

The shape of the second lookup table is effectively the opposite of the first. In other words, as the reassignment rate ratio goes up, the state of turmoil in Xerox (and angst about if/where/when one might be reassigned) similarly goes up and this tends to decrease the internally perceived state of Xerox. Note that this lookup table is less severe than the first one, reflecting my assumption that this effect is not quite as dominant as the first. These two factors are then multiplied together to form the total internally perceived state of Xerox.

The perception of the world outside of Xerox relies on exogenous data. My formulation takes the current time and uses it as the input to a lookup table that then yields the exogenous metric for the state of the world outside of Xerox. I tried to keep this as simple as possible. The methodology I used was as follows. First, I reasoned that what I was trying to capture in this lookup table was some notion of how attractive the world outside of Xerox is. Very crudely speaking, I argue that how well Wall Street was doing was a somewhat plausible surrogate variable for this. So I started with the normalized daily close values for the three major stock market indices – the Dow Jones Industrial Average, the S&P 500, and the Nasdaq. Note that these had all been normalized in such a way that their close on January 2, 1998 was equal numerically to the value of the Xerox stock close that day. However, this data was daily data (it is what was plotted earlier in Section 3.2) and was very noisy. I reasoned that someone entertaining leaving a company because the world beyond the company appears more attractive is not going to make this decision on the basis of daily information. So I decided to add in an effective perception delay to this raw data by taking a two-month rolling average of each of the daily close values. In my spreadsheet where I maintained the values I performed this calculation. It should be noted that since the raw number of days in this database were trading days (i.e. business days), and I wanted my rolling average to be over two months of calendar time, I performed the rolling average calculation using a basis of 43 trading days. I arrived at this number as follows:

$$43 \text{ trading days} \approx (5 \text{ trading days per week} / 7 \text{ calendar days per week}) * 365 \text{ calendar days per year} * (2 \text{ months desired rolling average basis} / 12 \text{ months per year})$$

I next decided to average these three rolling-average values together figuring that this would provide a decent composite picture of the state of the markets and therefore the economy and therefore the world beyond Xerox. Finally, I normalized this last stream of values by dividing each of them by the value of the average on the first day of the model (technically, I used January 2, 1998 since January 1 was not a trading day). This provided an index, as a function of time, which attempts to measure the state of the world outside of Xerox. Note that, per the discussion in the previous section, this measurement is then used as the input to a lookup function that ultimately helps to determine the attrition rate. Two views of this data appear next. Note that in the final version of the data that appears in the lookup table I have made the

assumption that after December 7, 2001 (the last day for which I downloaded the raw data) the value of the lookup table maintains the same value as it had on that date.

### Derivation of State of the World Outside of Xerox from Mkt Indices 1/1/98 - 12/7/01

Source: <http://chart.yahoo.com> - Normalized index daily close values are scaled so that they equal the Xerox close on 1/2/98

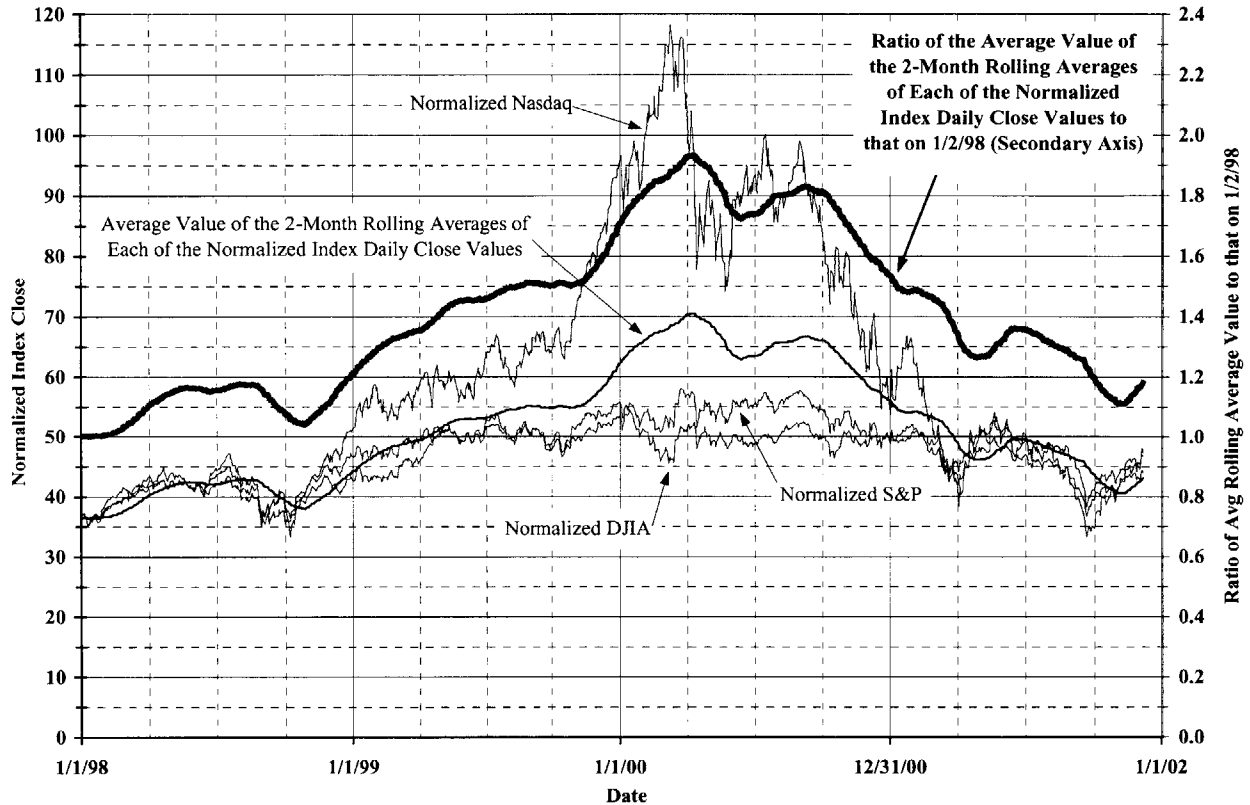


Figure 29: Derivation of the State of the World Outside of Xerox from Market Indices 1/1/98 – 12/7/01

Lookup Run

Lookup Table for Perceived State of the World Outside Xerox

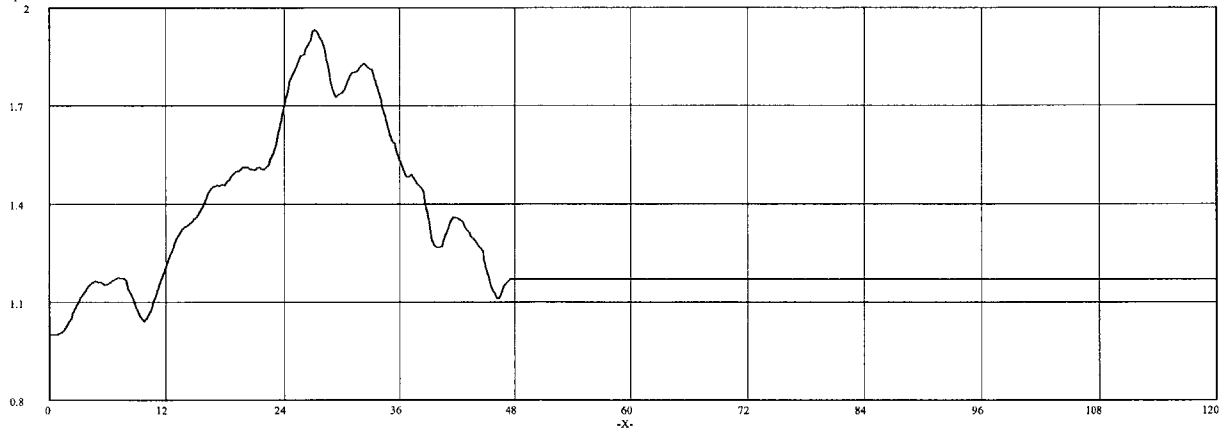


Figure 30: Lookup Table for Perceived State of the World Outside of Xerox

## **11. Sales Force Time Allotment**

### **11.1 Discussion**

As the reader will recall, the third major factor contributing to the overall effectiveness of the sales force is how much time they actually spend selling. The high-level approach I have taken to compute this is to divide a sales rep's time into three buckets: One is time actually selling, one is time addressing customer administrative issues (such as billing problems), and the third is what I call overhead activities (which essentially encompass everything else). I have simplistically assumed that there are a fixed number of hours in the week (40) for each rep. Additionally, the decision-making rule that determines how a rep allots their time is one in which selling time is actually given the *lowest* priority. While this is hopefully not always the case, the references cited earlier in combination with what I heard in my interviews suggested that during the reorganization addressing customer administrative issues, and having to live with the reality of certain newly added overhead activities, resulted in selling time being pushed to the back burner. It should also be noted that within the overhead category I have five sub-categories for overhead time, all of which will be described in the next sub-section.

In addition to certain references already cited, the following should provide some additional backdrop on the issue of sales force time allotment. From an analyst's report issued in April 1999:

Xerox's revenue growth was hurt by sales force and restructuring initiatives, a self-inflicted wound. Xerox is moving to an industry solutions approach similar to IBM's, so spent time on sales force training, which reduced their time spent with customers. Some sales people spent almost half their time away from customers.<sup>91</sup>

And from another issued a week later:

CFO Barry Romeril noted that Xerox took its eye off the revenue-growth ball during the period as the focus shifted to the company's new global-solutions initiatives, announced in January 1999. During the quarter [first quarter of 1999], Xerox made several one-time investments in conjunction with the company's industry-oriented global-solutions strategy. These investments and additional training (about 50% above normal first-quarter training levels in the U.S.) hurt productivity in the March period. The negative factors were greater than the company anticipated.

In the U.S. alone, Xerox devoted about 40-50% more hours than usual to different types of salesforce training.<sup>92</sup>

Later in the year, in the October timeframe, came these excerpts from two different stories in the media:

Xerox salespeople are being taken off the streets for up to two weeks at a time – to be trained to forget much of what they used to do. “They’re trying to change

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<sup>91</sup> Milunovich, Steven, Stern, Robert, and Hansen, Robert. Merrill Lynch Comment on Xerox Corporation, April 23, 1999.

<sup>92</sup> Runkle, Rebecca F. and Wexler, Stacey. Morgan Stanley Dean Witter U.S. Investment Research on Xerox, April 30, 1999.



the way they've been selling for generations, going from boxes to solutions, from geography to industries," says David A. Nadler, chairman of Delta Consulting Group.<sup>93</sup>

And

A rapid consolidation of billing centers has left Xerox salespeople spending as much as 40% of their time getting orders right and answering billing questions, the company says.<sup>94</sup>

## 11.2 Description and Analysis of this Subsection of the Model

The structure of this section of the model is as follows.

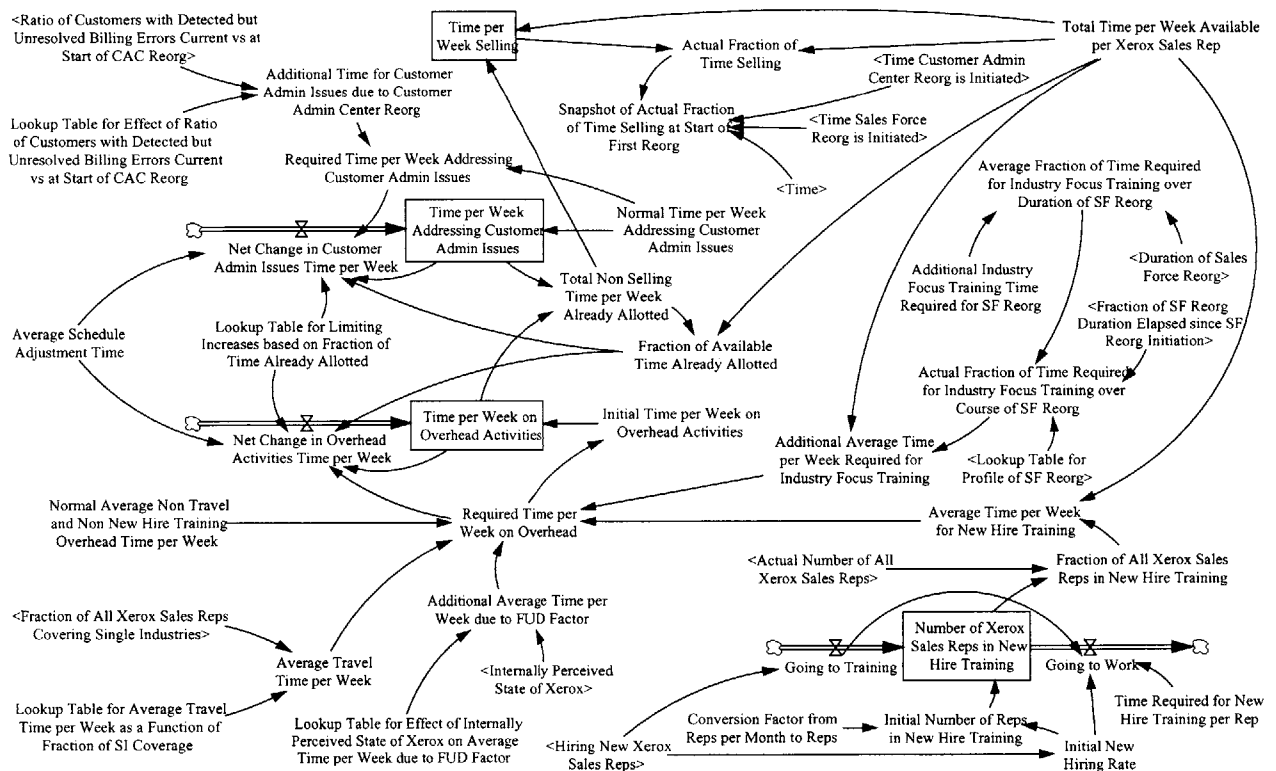


Figure 31: Model View – Sales Force Time Allotment

The fundamental calculation that is done is that the time spent on admin issues and overhead is added together and whatever is left over from the total time available per week is what gets applied to selling time. Note that I have drawn time selling per week with a box as if it were a

<sup>93</sup> "Why Xerox is Struggling / Sales Turmoil Mars its Turn toward Digital Technology." Brady, Diane, *Business Week*, October 25, 1999, p. 44.

<sup>94</sup> "A CEO Tussles with a Jam in Xerox Machine." Klein, Alec, *The Wall Street Journal*, October 28, 1999, p. B1.

stock but technically, within the model, it is an auxiliary variable. It should also be noted that this structure could very easily allow for negative hours to be calculated for selling time if the required time for the other two factors was high enough. To prevent this I have included a lookup table that essentially scales back the increase in hours that can be applied to admin and overhead activities so that the number of total hours available is never exceeded. This table looks as follows.

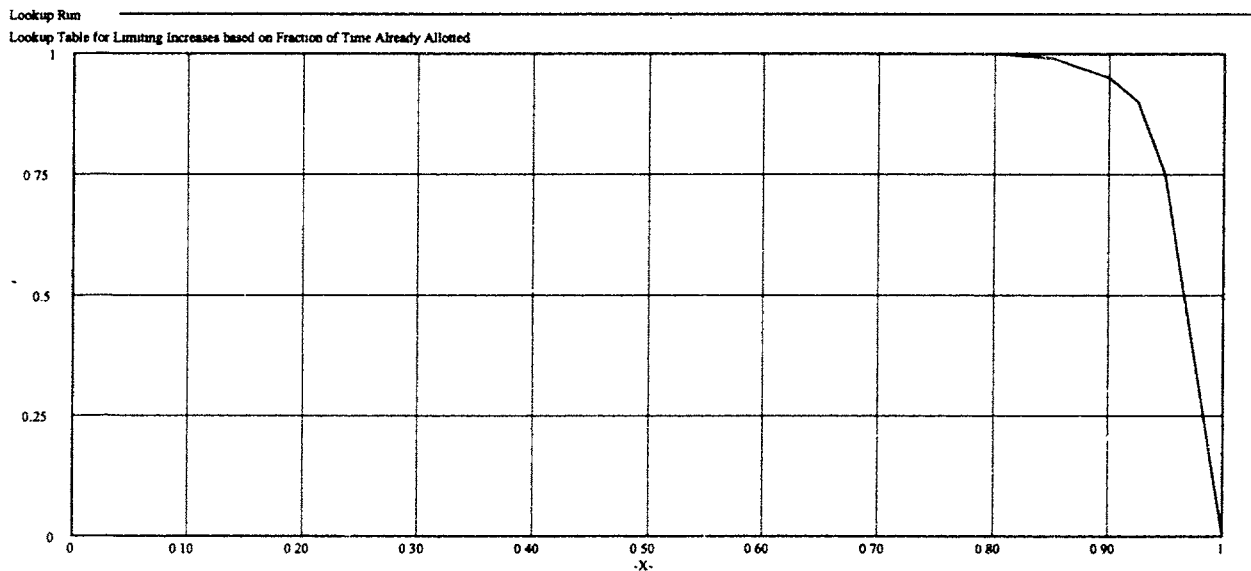


Figure 32: Lookup Table for Limiting Increases based on Fraction of Time Already Allotted

The admin time stock consists of a normal amount of time spent per week on these issues (I've used two hours, based on conversations with sales reps) plus an additional term that accounts for having to deal with those additional billing issues that arise as a consequence of the customer administration center reorganization. The structure for this is familiar: I use a ratio of the current value to a snapshot at the start of the CAC reorganization as the input to a lookup table. When the ratio is one, meaning that fraction of customers with billing errors is unchanged, then obviously the added number of hours should be zero. When the ratio is less than one – meaning that there are fewer customers with billing issues – then the lookup value should be negative. Note that I have chosen a value for this extreme – negative one hour – that will ensure that the total number of admin hours can never be below zero assuming that the normal number of admin hours never drops below one. When the ratio is above one then sales reps have to spend additional hours on admin issues. Based on the references cited earlier, I have modeled the maximum additional number of hours here to be 15. The lookup table appears at the top of the next page.

Lookup Run  
 Lookup Table for Effect of Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg

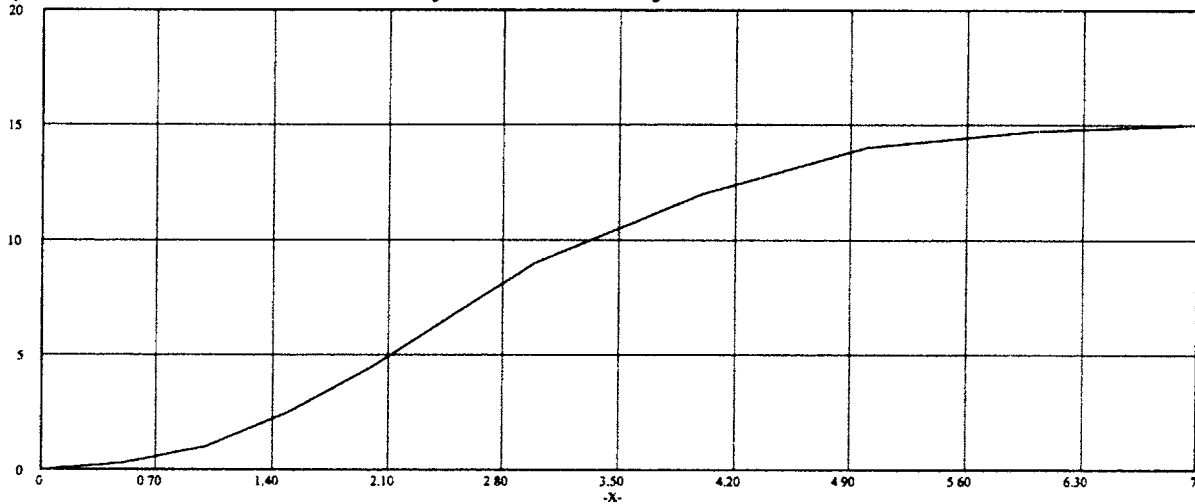


Figure 33: Lookup Table for Effect of Ratio of Customers with Detected but Unresolved Billing Errors Current vs. at Start of CAC Reorganization

The calculation of overhead time is more complicated, consisting of five factors. The first is the amount of time a sales rep normally has to spend on overhead each week, exclusive of travel and regular (i.e. non-new-hire) training. I have used a value of three hours for this, figuring this accounts for staff meetings, non-customer email, and the like. The second factor is the amount of travel time per week. One of the messages that came out of my interviewing was that because of the industry vs. geographic alignment, travel time (or “windshield time” as one interviewee called it) increased. I model this as a lookup table where the input is the fraction of all sales reps covering single industries. The table is linear, with all multiple industry coverage at 4 hours and all single industry coverage at 8 hours.

Lookup Run  
 Lookup Table for Average Travel Time per Week as a Function of Fraction of SI Coverage

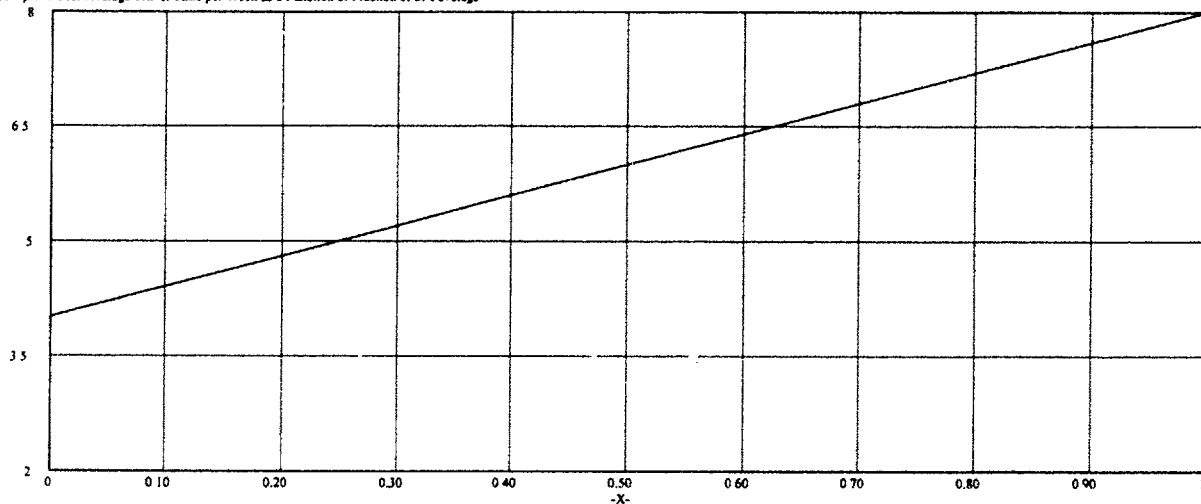


Figure 34: Lookup Table for Average Travel Time per Week as a Function of Fraction of Single Industry Coverage

The third effect is what one sales rep called the “FUD” factor, FUD for “fear, uncertainty, and doubt.” I think of this as the time that people spend milling around, gossiping, updating resumes, and generally not focusing on their jobs because of the level of anxiety in the organization. Yet again, I use a lookup table to quantify this, with the input being the internally perceived state of Xerox. The way I have it modeled, only if the internally perceived state of Xerox drops below its normal value of one will the effect come into play. The table looks like this.

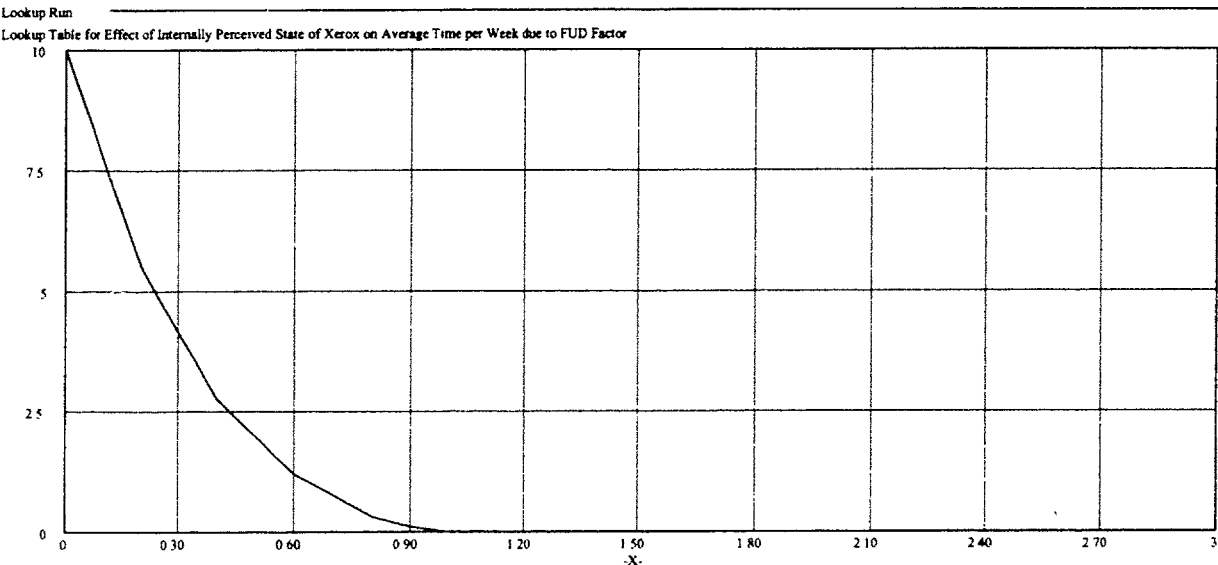


Figure 35: Lookup Table for Effect of Internally Perceived State of Xerox on Average Time per Week due to FUD Factor

The fourth contributor to overhead time is the amount of time required for new hire training. My rationale for this is that as attrition goes up and the company is forced to hire new people, those people have to be trained before they can effectively do their jobs. I set up a stock to track the number of sales reps currently in new hire training where the residence time in the stock is equal to a half month – i.e. two weeks – and the outflow is a FIXED DELAY of the inflow, with the delay time being the two weeks. This number is then divided by the total number of sales reps in the company to yield the fraction of them that are in new hire training. This fraction is then multiplied by the hours available per week for each rep to yield the average time per rep spent in new hire training.

The final contributor to overhead is the amount of training time required due to the industry solutions reorganization. As previous references suggest, each rep had to go through two weeks (0.5 month) of training for this. The structure here scales that time so that it is proportional to the sales force reorganization profile.

In equilibrium and with no external (to this view) effects active, the normal pre-reorganization time allotment for a sales rep is 9.2 hours for overhead (23%), 2 hours for admin issues (5%), and 28.8 hours actually selling (72%).

## **12. Product Line Attractiveness**

### **12.1 Discussion**

As a number of the references here have already suggested, Xerox' product line began to lose its luster, especially relative to the competition, as 1999 and 2000 proceeded. Also as suggested, a fair amount of this perceived differential (if not most of it) was due to what Xerox' competition did, not what Xerox did not do (although the latter was probably still an effect). There are a slew of attributes upon which customers base their evaluations of the attractiveness of a document processing product. These include speed, volume, image quality, productivity, reliability, purchase cost, running cost, size, noisiness, paper capacity, network connectivity and compatibility, finishing options, registration, the range of substrate sizes, types, and weights that can be run, etc. Time has not permitted me to conduct a thorough investigation of the history of all of these attributes so as to construct a data-driven comparison between Xerox' product line over the years and that of its competitors. Instead, I have taken the approach of constructing lookup tables that, as a function of time, show the attractiveness of Xerox' product line as if that of the competitors' product lines were constant. In other words, each lookup table combines the effects of the attractiveness of Xerox' product line relative to that of its competitors.

### **12.2 Description and Analysis of this Subsection of the Model**

The structure of this part of the model is about as simple as it gets, as one can see below. A switch controls which of two modeled lookup tables to use and, together with time as the input variable, determines the total attractiveness of Xerox' product line. First, the model structure.

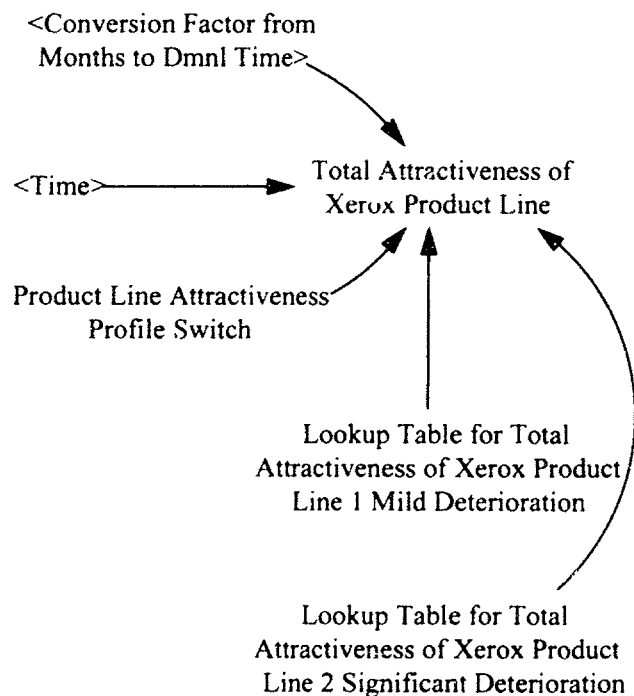


Figure 36: Model View – Product Line Attractiveness

Now the two lookup tables. Note that these are very much approximate estimates from my perspective and experience in the industry, something that has included a fair amount of competitive benchmarking (none of which, however, is data I'm at liberty to directly share with the public). Unfortunately I was not able to trick Vensim into using the same vertical axis scale for both lookup tables – please note that although the two profiles are different, they are not nearly as different as a casual glance might lead one to believe.

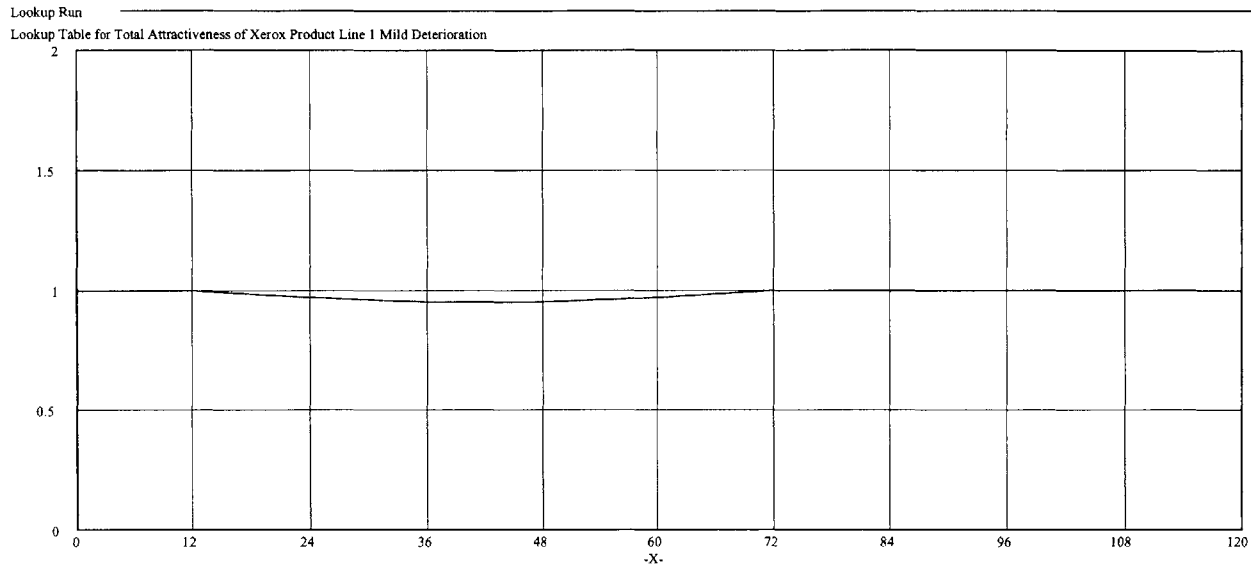


Figure 37: Lookup Table for Total Attractiveness of Xerox Product Line - Mild Deterioration

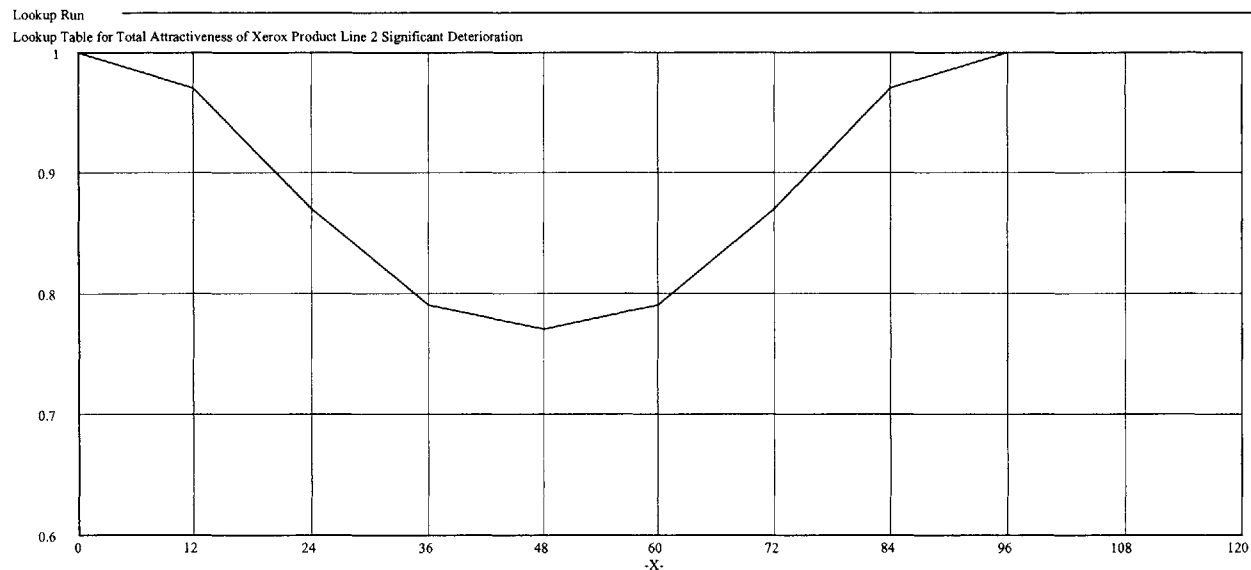


Figure 38: Lookup Table for Total Attractiveness of Xerox Product Line - Significant Deterioration

## 13. Satisfaction with Other Factors of Xerox

### 13.1 Discussion

As mentioned much earlier in this document, by “other factors” I mean to include all aspects of the customer’s experience with their vendor excluding those associated with the sales force and the product line. In the case of the factors studied here in reference to Xerox, what this equates to are issues surrounding the customer administration centers (CACs) and their consolidation. Here I postulate two elements that eventually contribute to a customer’s total satisfaction with the other factors of Xerox. The first concerns how familiar the CAC staff is with the customers they service. The second concerns the fraction of all customers who have detected but unresolved billing errors.

### 13.2 Description and Analysis of this Subsection of the Model

This section of the model appears below.

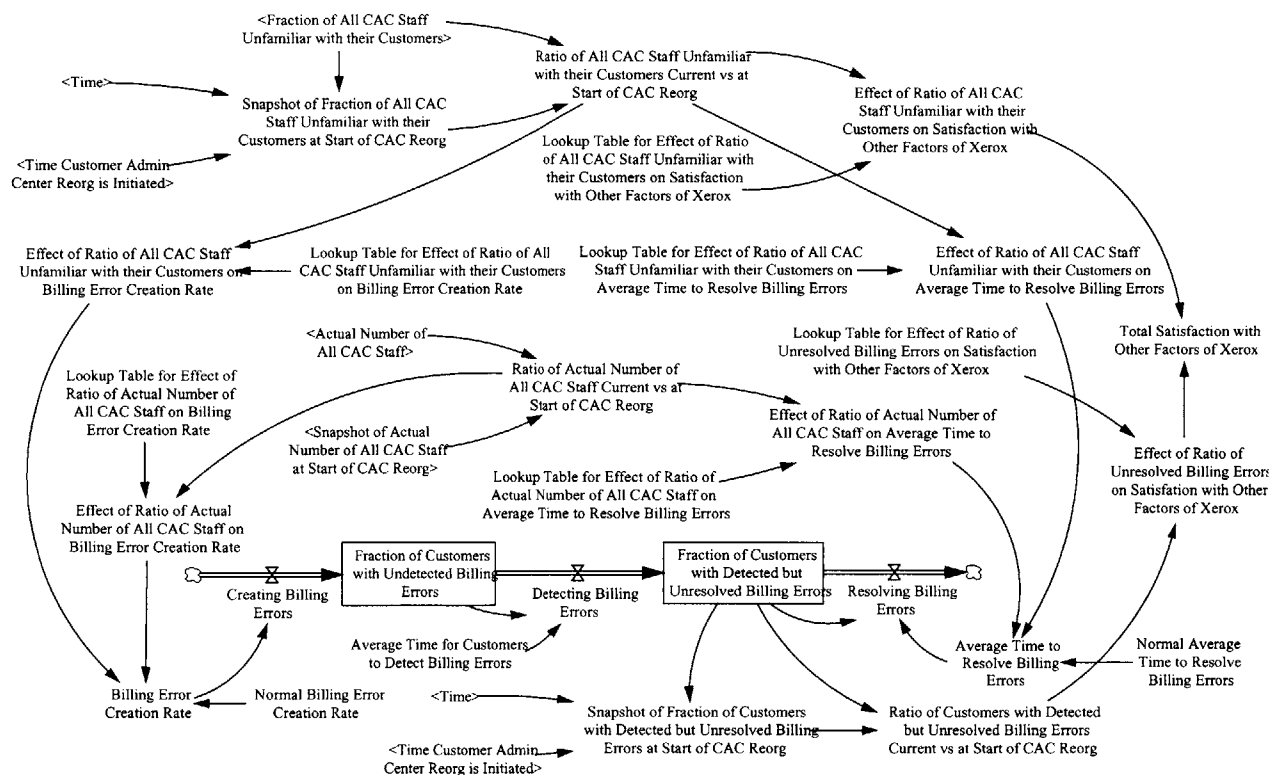


Figure 39: Model View – Satisfaction with Other Factors of Xerox

The top half of this portion of the model deals with the issue of CAC staff unfamiliarity with the customers they service. Utilizing a structure used a number of times already in the model, I compute a ratio of this fraction at the current time to that when the CAC reorganization began. This then feeds through a lookup table to compute the effect that this dimension has on the total

satisfaction with the other factors of Xerox. The table follows below. Note that as the level of unfamiliarity goes up, the effect on the satisfaction with other factors goes down.

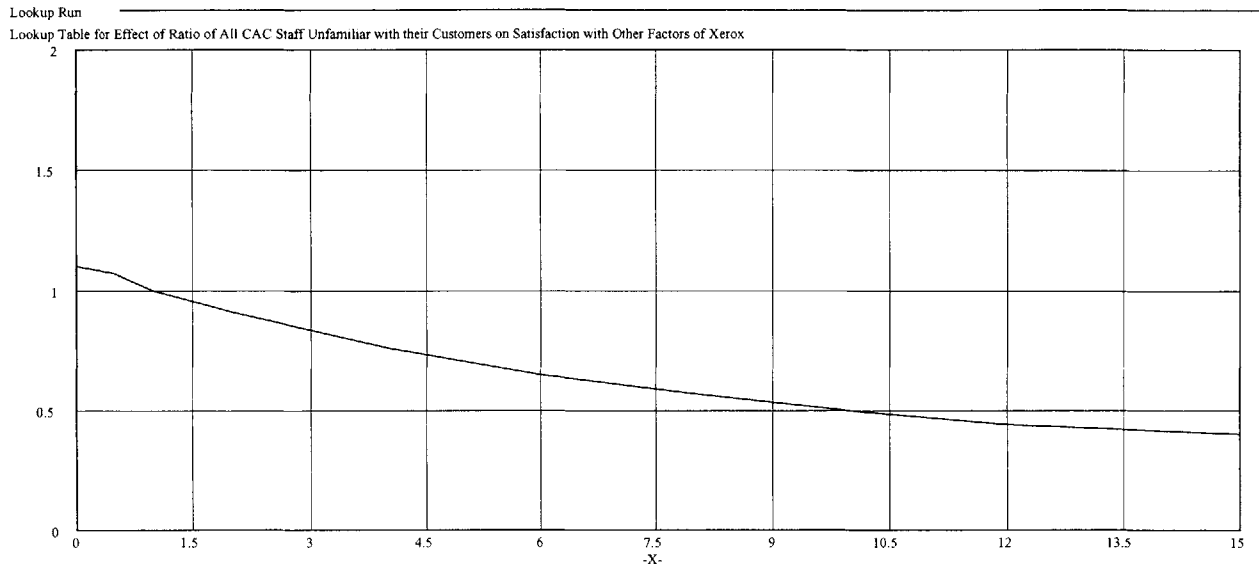


Figure 40: Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox

The bottom half of this section of the model is concerned with the generation of billing errors and their effects. I have constructed a simple two-stage aging chain to classify customers with billing errors as being either those for whom the errors are undetected or those for whom the errors are detected but not yet resolved. The hypothesis is that ultimately the fraction of customers with detected and unresolved billing errors affects the total satisfaction with other factors of Xerox. In turn, there are a host of factors that contribute to this fraction by altering the rates of error creation and error resolution. Each of these factors utilize a lookup table, with the input to the table being the ratio of some quantity to its value at the start of the CAC reorganization, as the method by which the effect is determined. I suggest that there are two factors contributing to error creation: one dealing with the unfamiliarity of the CAC staff with their customers and the other dealing with the number of CAC staff, the latter being something that was consciously lowered during the reorganization so as to save money. Both of these effects modulate a normal billing error creation rate that is measured in fractions (of customers having errors generated for them) per month. Data on this parameter was unavailable so I have assumed a value of 0.017 fraction/month that roughly corresponds to 20% of customers having a billing error per year.

I next suggest that the average time to resolve billing errors is modulated by these same two effects except that independent lookup tables apply. I estimate that the normal average time to resolve billing errors is 1.5 months, figuring that since the billing cycle is monthly it will take at least that long for a customer to detect that any error has been corrected.

In between error creation and detection I assume a first-order detection delay whose average value is one month, again based on a monthly billing cycle. Under this set of parameters and in



equilibrium, the fraction of customers with detected but unresolved billing errors is about 2.5%. Finally, the ultimate billing error-related effect that influences total satisfaction with the other factors of Xerox has as its contributors a lookup table whose input is the fraction of customers with detected but unresolved billing errors. The following pages show all of the lookup tables used.

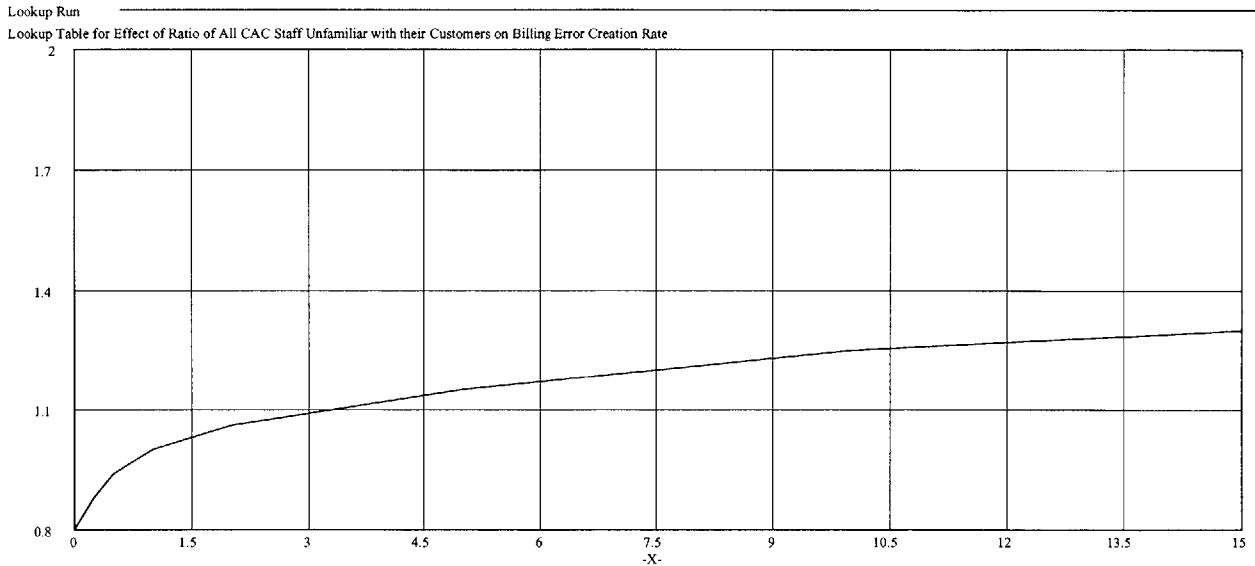


Figure 41: Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation

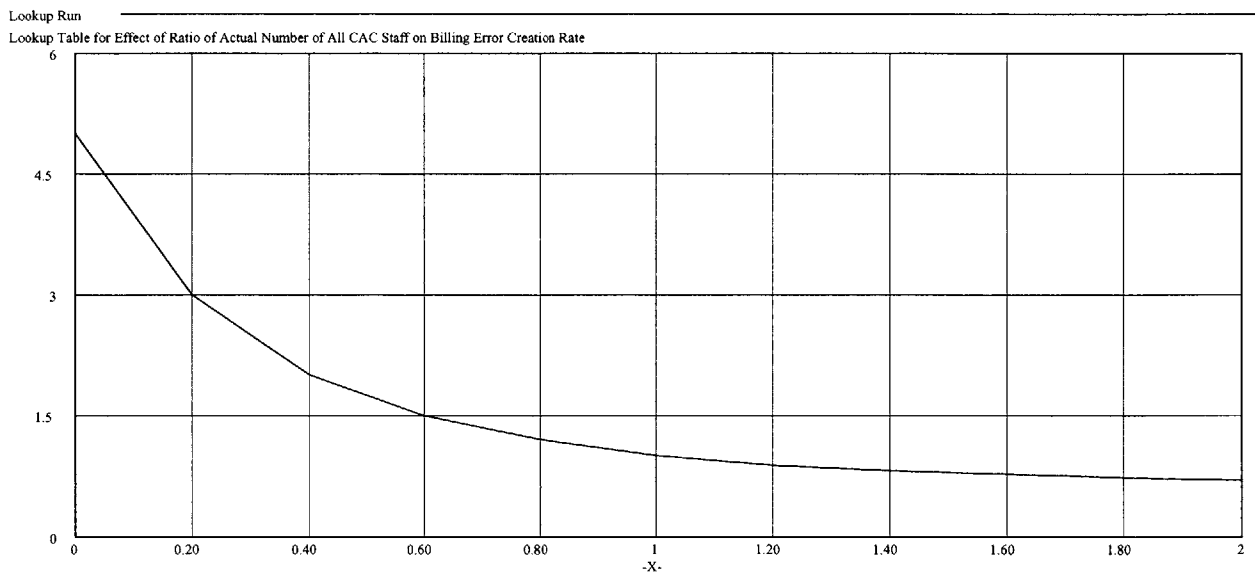


Figure 42: Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation Rate

Lookup Run

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors

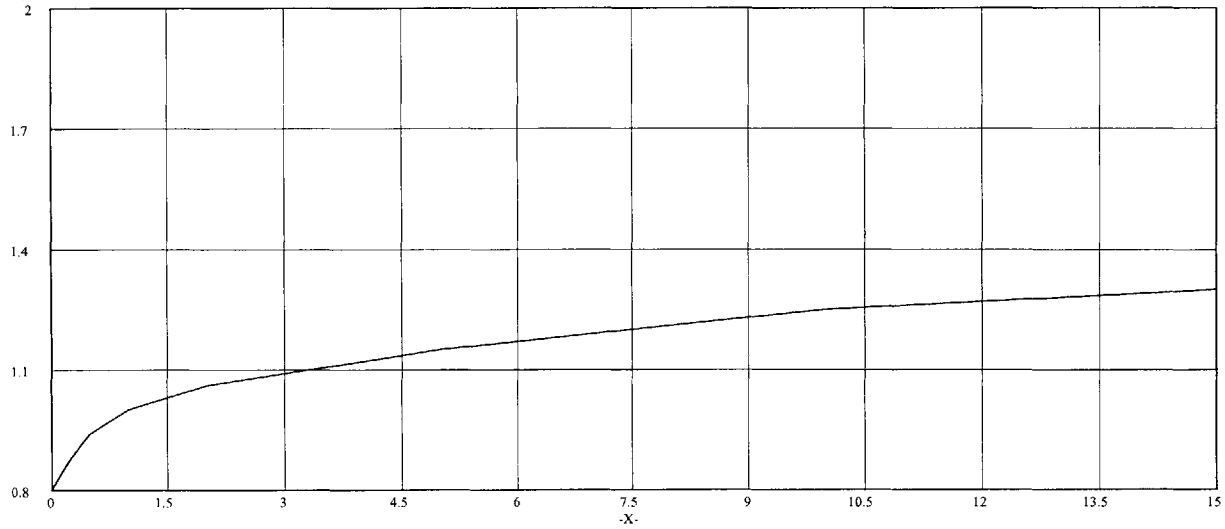


Figure 43: Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors

Lookup Run

Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors

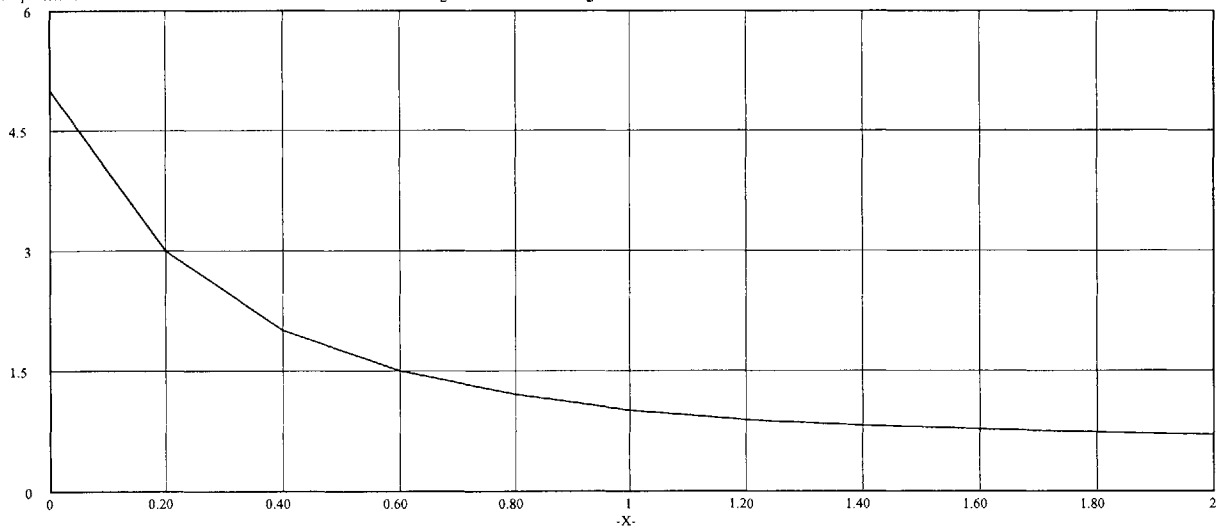


Figure 44: Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors

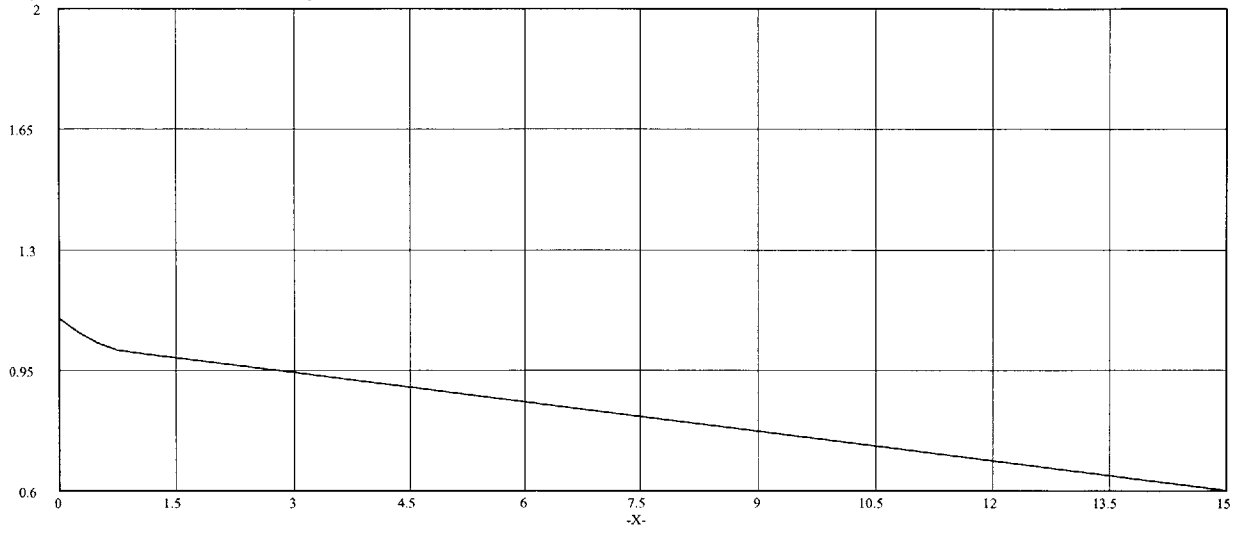


Figure 45: Lookup Table for Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox

## 14. Customer Administrative Center Reorganization

### 14.1 Discussion

The final section of the model concerns the actual mechanics of the CAC reorganization. The dynamics here are similar to those of the sales force reorganization. By this I mean that the primary distinction being made for CAC staff is how familiar they are with their customers. However, as alluded to in a number of the references, the one of the primary goals of the CAC reorganization and consolidation was to reduce the number of staff. I have accounted for not only normal attrition and terminations due to the reorganization but also higher-than-normal attrition because of the turmoil. I have also built in a provision for management to have anticipated some of the people leaving due to the turmoil and to have thereby done what I call “anticipatory” hiring.

### 14.2 Description and Analysis of this Subsection of the Model

The model structure for this subsection is as follows.

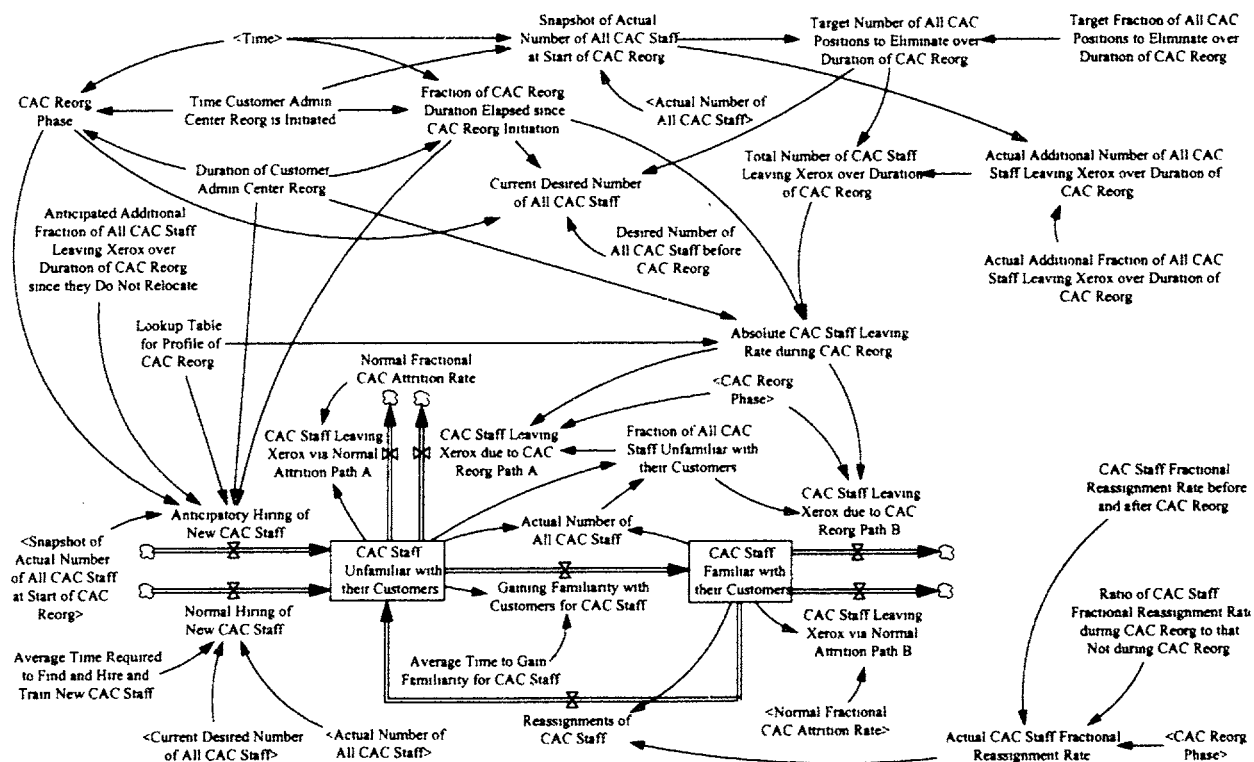


Figure 46: Model View – Customer Administrative Center Reorganization

Based on the references cited earlier, the start time I assume for this reorganization is month four (April of 1998). Additionally, I assume a duration of six months. Normal hiring is governed by a simple goal seeking structure with the average time to find, hire, and train new staff set to two months (this is lower-skilled work than the direct sales force for whom this time was assumed to

be longer). The target number of staff is something that changes as a function of time. Before the reorganization there is a target value (which I have arbitrarily set to 1,000), after the reorganization there is a target number which is computed from a target fraction of staff that management wishes to eliminate. I currently have this fraction set to 0.25 based on closing one of the four extant admin centers at the start of 1998, although when one considers the consolidation of the CBU administrative staff and functions it was probably higher. During the reorganization I linearly ramp between these two levels.

Also on the “inflow” side is the “anticipatory” hiring mentioned earlier. The rationale is that, hopefully, management realized that upon instituting the consolidation there would be more staff leaving Xerox than just those originally filling the positions that management wanted to take out (i.e. the turmoil-related leaving mentioned above). This inflow accounts for management guessing what this fraction was going to be and starting the hiring process to bring people on board early enough so that those positions never would have been vacant. Note that it is assumed that the hiring process to bring them in started early enough that they can start fully productive work on the day they are brought in. Only if management guessed incorrectly at the additional fraction of people that would leave (most likely underestimating this quantity, it seems to me) would the “normal” hiring mechanism have to be invoked (with its inherent delay time due to having to find, hire, and train people) to make up the shortfall. In other words, these people are brought in during the course of the reorganization in a flat profile (i.e. constant rate over time). This process assumes pretty astute, proactive, and forward-thinking management. I’m not sure to what degree this was the actual case.

In most baseline runs I assume that management underestimates the actual fraction of additional people who leave by 15 percentage points. I also assume that in actuality the additional fraction that does leave is equal to 25%. As such, the total fraction of CAC staff that actually end up leaving due to the reorganization (remember, normal attrition is separate from this) is 50%. The above two figures mean that management guesses that an additional 10% of the staff will leave but in reality the figure turns out to be 25%. As such, there are 15% of the original staff that leave that management did not anticipate leaving and that therefore have to be hired by the normal hiring mechanism so as to keep the staff at the desired, post-reorganization level.

Within the two stock structure there is a first-order again chain “gaining familiarity” flow governed by an average time delay of one month. There is also a reassignment loop. When the reorganization is not going on the fractional reassignment rate is set to 0.01/month, roughly equivalent to 12% per year which sounds about right, although hard data was not available. During the reorganization I assume that this fractional rate is considerably higher (by a factor of five) due to the fact that people were realigned so as to be in specific vertical industries.

Exiting the two stocks are two sets of pathways. One is normal attrition that is governed by a fractional rate of 0.02/month (this is double the normal sales rep attrition rate, based on assuming that in the environment of a customer admin center turnover is typically higher than in the sales office). The other pathway is that by which people leave as a result of the reorganization. This path includes not only those positions that management wanted permanently to get rid of but also those people leaving due to the turmoil. I have a lookup table for the profile of the reorganization but, since this reorganization is over a relatively short time, I simplistically have it set to be a flat profile.

I initialized this section of the model to equilibrium values and this resulted in a pre-reorganization value of about 2.9% for the fraction of CAC staff unfamiliar with their customers. I then ran three cases of just this section of the model with the actual reorganization taking place (starting at month four). The first, Run 8, is the model with all the parameters as mentioned earlier. The second, Run 9, is the same as Run 8 except that I improve management's estimate of the actual additional fraction of people that leave to be perfect. In other words, management guesses 25% additional people leave and this is what actually happens. The third run, Run 10, is the opposite extreme – management does not anticipate any additional people leaving beyond those filling the positions that they are consciously eliminating. To more clearly see what happens, I have only shown time through month 18.

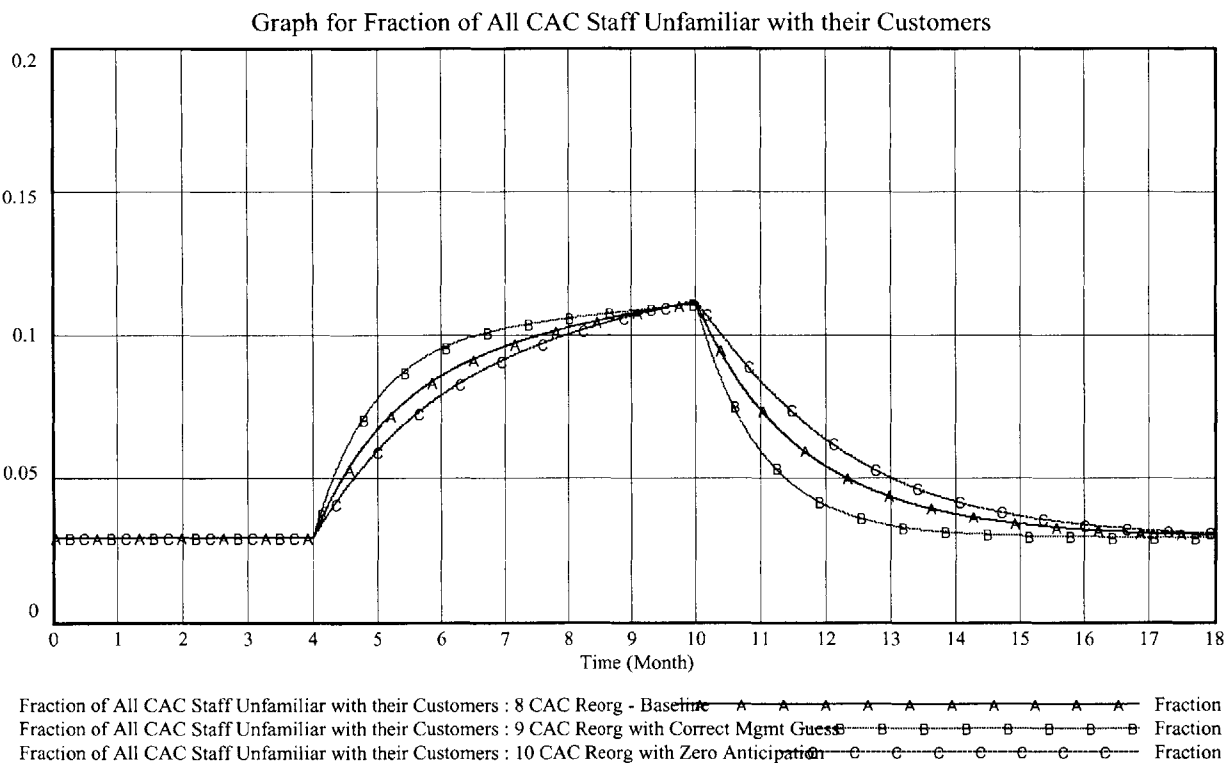


Figure 47: Customer Administrative Center Reorganization Dynamics

As the graph shows, the better job management does at guessing the additional fraction of people that will leave (and “preemptively” hiring ahead of time appropriately), the sooner after the reorganization is over will the fraction of CAC staff unfamiliar with their customers ramp down. However, the penalty for this, if it is one, is that the fraction of unfamiliarity ramps up sooner during the reorganization. Finally, note that the peak fraction of unfamiliarity is unchanged in all cases. In other words, anticipatory hiring is not a knob to change the peak fraction of unfamiliarity. In fact, the only knob management has in this model to change the peak fraction of unfamiliarity during the reorganization is to lower the fraction of positions that are eliminated and/or to lower the level of reassignments of people who remain.



## 15. The Full Model

### 15.1 Analysis and Discussion

To analyze the entire model I have chosen to first analyze the effects, at the system level, of each of the three major portions. In each of these next series of runs I leave all of the variables and parameters at their nominal values as described earlier BUT the only portion of the model that is active is the particular section under analysis. In other words, I utilize the model as if only that section had been modeled.

Run 11 shows only the effects of the sales force reorganization utilizing the “actual” profile for its implementation. The state of the world outside of Xerox is ignored. Run 12 is the same as Run 11 except that the state of the world outside of Xerox is included.

Run 13 shows only the effects of product line attractiveness with the “mild deterioration” profile active. Run 14 is the same except with the “significant deterioration” profile active instead.

Run 15 shows only the effects of the CAC reorganization.

Finally, Run 16 is with the entire model active and the “mild” product line deterioration profile and Run 17 is with the entire model active and the “significant” product line deterioration profile. The first graph shows the effects of just the sales force reorganization on Xerox’ market share.

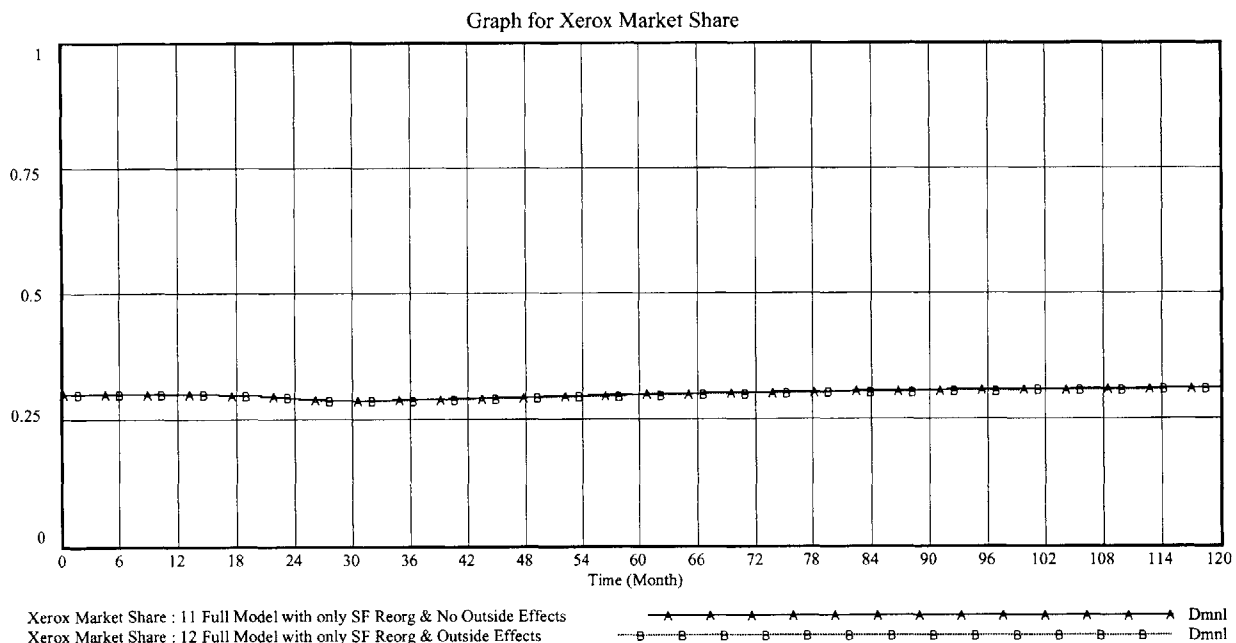


Figure 48: Xerox Market Share - Full Model but with only Sales Force Reorganization Active

The message is that, at least as modeled here, outside effects do not have significant effects on market share. Despite this, the sales force reorganization does seem to have a noticeable effect, contributing to about 1.2 percentage points of peak market share loss. This may not sound like much but in this competitive market a difference of a point is in fact noteworthy, if not significant. Another crucial point in this graph is that the peak market share loss occurs in about



month 30 (i.e. about the middle of 2000) and the state of lowered market share lingers for at least another 36 months (i.e. about three years – into 2003). This is all despite the fact that the reorganization itself was officially over by about month 24 (i.e. at the end of 1999). The “inertia” of the system, which is driven by (among other things) the assumed life of products in the field of 4 years, is significant. As such, damage control efforts that management applied after they realized the sales force reorganization was not going according to plan (such as altering the compensation plan to try to stem sales force defections) might have stemmed some future losses but a certain amount of damage had already been locked in.

The next graph shows the two product line only runs.

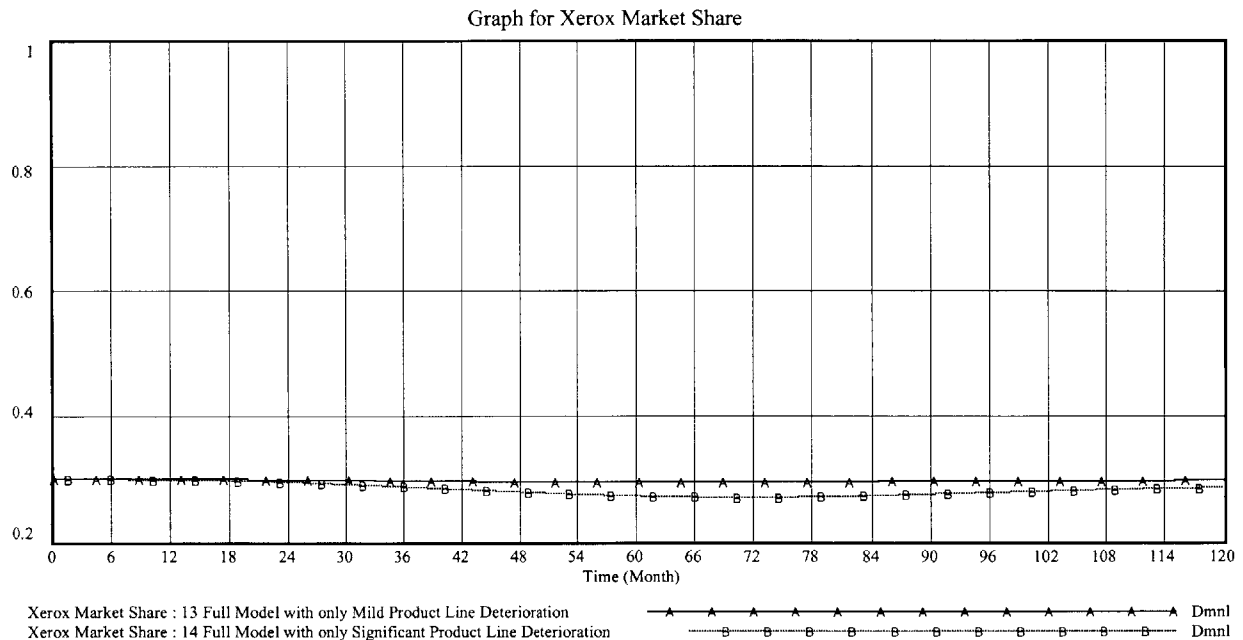


Figure 49: Xerox Market Share - Full Model but with only Product Line Attractiveness Active

Clearly, at least as modeled here, the difference in product line attractiveness has a noticeable effect on market share, as one would expect. Also, the peak market share losses occur roughly two years after the corresponding minimum points in the respective product line deterioration profiles.

The next graph shows only the effects of the CAC reorganization.



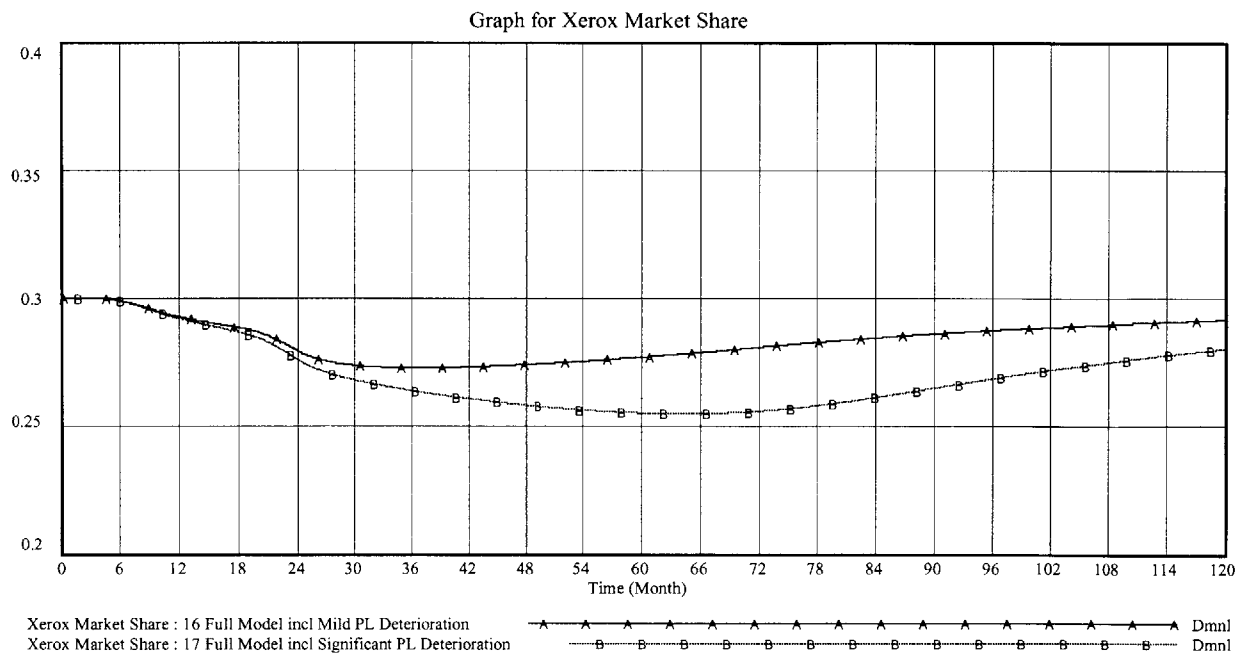


Figure 51: Xerox Market Share - Full Model Active

Certainly as simulated here, the effect of the product line deterioration profile is quite significant, resulting in a difference in peak market share loss of about 1.8 percentage points.

The following graph shows all of these various full model runs in a single picture.

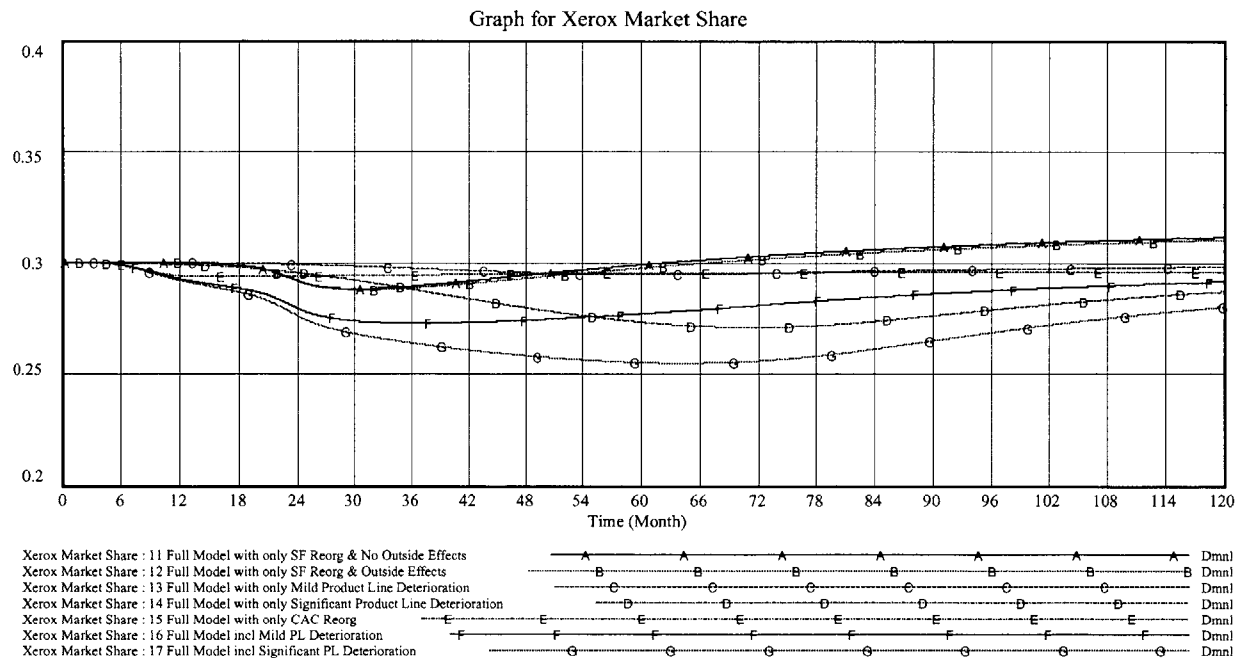


Figure 52: Xerox Market Share - Partial and Full Model Active

Related to the two cases with just the sales force reorganization in effect, one thing to note is that this graph more clearly shows that if only the sales force reorganization had occurred, eventually market share would have risen *above* the initial level. This is due to the assumption built into the model that, in the long term, a higher fraction of single industry coverage does in fact lead to higher sales force effectiveness. However, another long-term consequence of the sales force reorganization was that sales reps would have less time to sell than before because they necessarily have more “windshield time.” So, for market share to ultimately be higher than it was initially (as a result of just the sales force reorganization), the benefits of single industry coverage must outweigh the detrimental effects of the added travel time. Note, however, that the crossover point in these two cases still takes until about month 60 to occur (i.e. the beginning of 2003 – three years after the end of the reorganization itself).

When one considers the runs in which the full model is active, one notes that they do not result in market share that rises above the initial level, despite the fact that these runs also included the very same sales-force-reorganization-only effects mentioned above. This is a result of the CAC reorganization that assumes a permanent decrease in the number of CAC staff and therefore a permanent increase in billing error generation rate and error resolution time. Both of these effects might not necessarily be permanent – this is one area in which management might be able to alter the long-term effects of the consolidation, perhaps through better billing systems that are less prone to having errors generated in the first place.

In terms of *peak* market share loss, the loss for just the sales force reorganization (with outside effects included) was about 1.2 points. For just the product line deterioration, the losses were about 0.5 point and 2.9 points for the mild and significant profiles, respectively. For just the CAC reorganization, the loss was about 0.6 points. For the entire model the values were about 2.7 points and 4.5 points for the mild and significant product line deterioration profiles, respectively. Note, however, that these peaks generally occurred at different points in time.

If one were to add the effects of each of the three factors at each point in time as if they could be linearly superposed, something I have done in Excel with the raw market share data from these runs, one would find the following (I assume outside effects are active in all cases). With mild product line deterioration, the total peak share loss would be about 1.9 points. Similarly but with significant product line deterioration, the peak share loss would be about 3.4 points. Notice how these “linear superposition” values compare to the peak share losses from the full model (2.7 points and 4.5 points, respectively). With mild product line deterioration, linear superposition *underpredicts* the peak share loss by about 0.8 points, which is equivalent to about a 30% underprediction of the full system prediction. With significant product line deterioration, linear superposition *underpredicts* the peak share loss by about 1.1 points, which is equivalent to about a 24% underprediction of the full system prediction. The message here is clear: *Xerox’ market share loss with all three factors operating over the actual timeframes that they occurred was worse than the simple sum of the effects of each factor had each one occurred individually.* In other words, all three factors combined in a non-linear fashion and reinforced each other in a “snowball” kind of ultimate effect.

The primary causal relationships and feedback loops involved in this effect will be described in more detail in the following section of the document. However, for now, consider management’s plight in this. Assume management had been able to predict just the individual negative consequences of each of the three factors considered here (even this is something they would probably have paid dearly to be able to do). Had they been able to do this, it is not

Given that the crux of the matter here appears to be the near-simultaneous confluence of each of these three factors, I reran the full system model, using both product attractiveness profiles but with the initiation of the sales force reorganization pushed out by an extra year (i.e. to month 24). Run 18 is with the mild product line deterioration profile and Run 19 is with the significant product line deterioration profile.

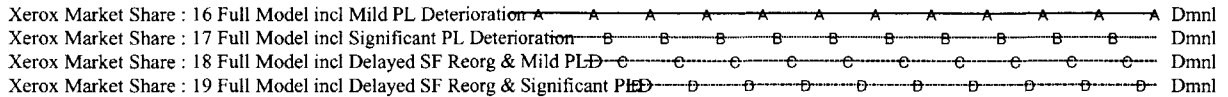


Figure 53: Xerox Market Share - Full Model with Different Sales Force Reorganization Start Times

Note the results here – in terms of peak market share loss, things get worse! This is because, although the overlap between the CAC reorganization and the sales force reorganization has been reduced, now the sales force reorganization is occurring closer to the peak of the product line deterioration. Note that, per my somewhat arbitrary profiles, the peak of the mild profile is at month 42 and that for the significant profile is at month 48. Nevertheless, this graph illustrates the point that having interrelated effects occurring right on top of each other can lead to a worse situation than if they are spread out. In Xerox' case here, if management had wanted to time the sales force reorganization to avoid the peak of the product line profile, they would have had to

project the product line attractiveness deficit accurately enough to know when it was going to occur.

## 15.2 Key Insights

At the highest level, the key insights from this analysis are the following. First, in consolidating the customer administrative centers the majority of Xerox customers now had assigned to them administrative staff who were unfamiliar with them, their history with Xerox, and their business. This, in combination with the fact that many of these staff were also unfamiliar with Xerox and its processes, meant that they were more prone to making billing errors and were less efficient in fixing them once they were discovered. This began the process of alienating Xerox' customer base and decreasing their satisfaction level with "other factors" of Xerox. It also had the simultaneous effects of contributing to lost revenues (since some receivables were lost) and of forcing the sales force to try to solve billing and other administrative problems introduced by this reorganization, thereby taking them away from selling. The key causal relationships that were activated as a result of what Xerox did are summarized in the diagram below. Note that management's key decisions in regards to the CAC reorganization concerned the two items in the upper left corner of the diagram – the number of CAC staff (which was reduced) and the reassignment of the remaining CAC staff (to new customers). Not shown explicitly, but also a contributing factor, was the fact that a certain amount of new CAC staff had to be hired, thus also lowering the CAC staff familiarity with Xerox processes and/or customers.

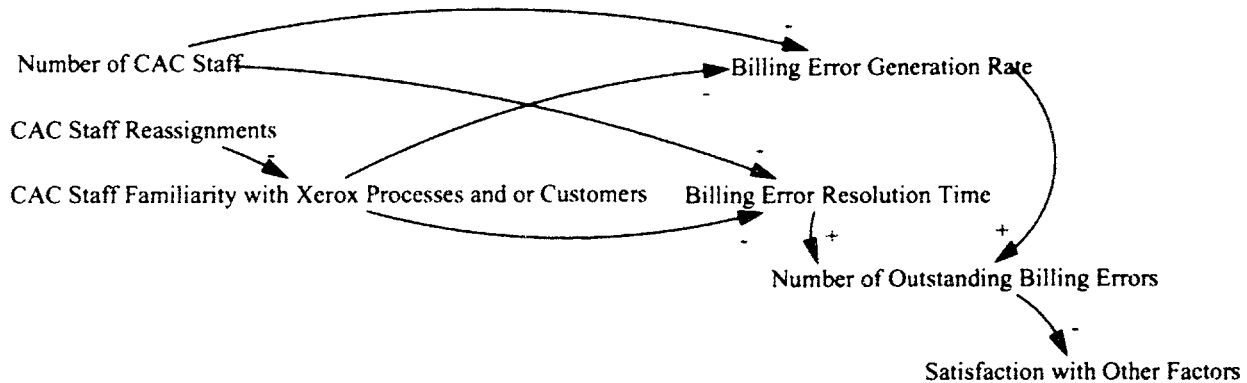


Figure 54: Causal Relationships - CAC Reorganization

The second key insight from this work is that the direct sales force realignment had the effect of breaking tremendous numbers of customer/sales representative relationships since many sales reps either left Xerox (due to the turmoil within Xerox and the relative attractiveness of the world outside of Xerox) or, if they stayed, had their territories changed. This further alienated customers and gave competitors an easier time of winning over Xerox "slots." The sales force realignment also resulted in sales reps spending less time selling, both in the short term (due to increased new hire training, industry realignment training, and "FUD factor" churn) and in the long term (due to increased travel time). This also contributed to customers deciding to go with competitors rather than Xerox. The key causal relationships and loops activated in this regard

are summarized in the following diagram. Management's most direct involvement here was in the two factors on the left side of the diagram – the (temporary) increased reassignment rate from multiple to single industry coverage and the training instituted to go along with it.

I have highlighted in bold arrows what I believe was management's primary thinking about the desired cause-and-effect scenario as a result of the sales force realignment. This is not to say that they did not consider the other relationship pathways and feedback loops that are shown here, but perhaps that they did not consider the magnitude of their consequences as carefully as they might have. Note in particular that the bolded arrows represent a one-way path. However, within the rest of the structure in this simplistic diagram, there is a positive feedback loop present that was activated during this reorganization. This is the one in which as the state of Xerox declines, the attrition rate goes up, and as the attrition rate goes up, the state of Xerox declines further. It should be noted that as this loop is activated in this manner it leads to the sales reps spending less time selling via two different pathways. First, higher attrition means that more new sales reps have to be hired, thus necessitating increased time (on average) spent in new hire training. Secondly, as the state of Xerox declines, time spent on "FUD factor" churning goes up. Both of these contribute to decreased sales force effectiveness – a classic example of "policy resistance" in which just the opposite effect happens from what was desired. Policy resistance is also evident in the fact that as the hiring rate goes up and a larger fraction of the sales reps are new, sales rep familiarity with the customers the new ones serve goes down, also decreasing average sales force effectiveness. Also, at least as far as just the sales force reorganization is concerned, Xerox perhaps unwittingly set off another factor that lowered sales rep selling time and therefore sales force effectiveness. This was by implicitly requiring that sales reps spend more time traveling since, usually, industries are less geographically centralized than groups of customers specifically organized for sales reps by geographic location. Finally, policy resistance is also evident in the decreased sales rep familiarity with their customers which also lowers sales force effectiveness.

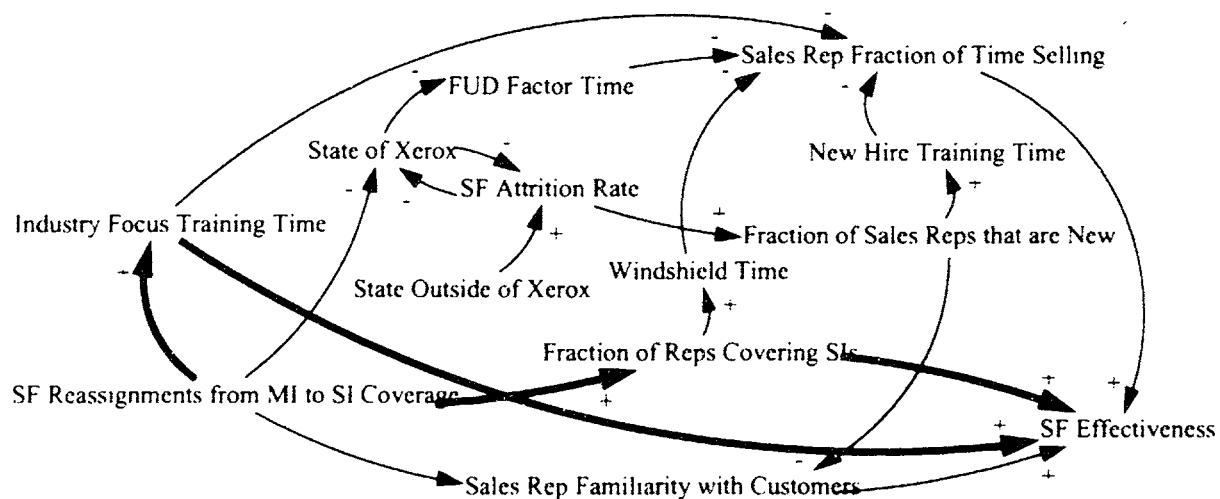


Figure 55: Causal Relationships - Sales Force Reorganization

The third key insight of this work is that as Xerox' product line began to look less attractive relative to that of the competition, customers had yet an additional reason to migrate from Xerox to the competition. Since I did not concentrate on the dynamics of this I will not speculate here on the causal relationships and feedback loops that might have been involved in just this effect.

Ultimately, however, my analysis shows that the almost simultaneous confluence of these three factors had a nonlinear effect on Xerox' business – an effect that was worse than the sum of the three individual factors had they each occurred alone. And, since the time constants involved in these dynamics and in the overall system that is the document processing market are in many cases on the order of years, the effects on Xerox' business were significantly longer than the duration of the causal factors themselves.

A system-wide diagram of the key causal relationships and feedback loops that have been considered in this thesis follows below. In it I have replaced the bold arrows in the previous diagram with dotted arrows and have used bold arrows to highlight what I believe were the key relationships and loops that were activated that, it appears, turned out to have significantly stronger effects than management either planned on or desired.

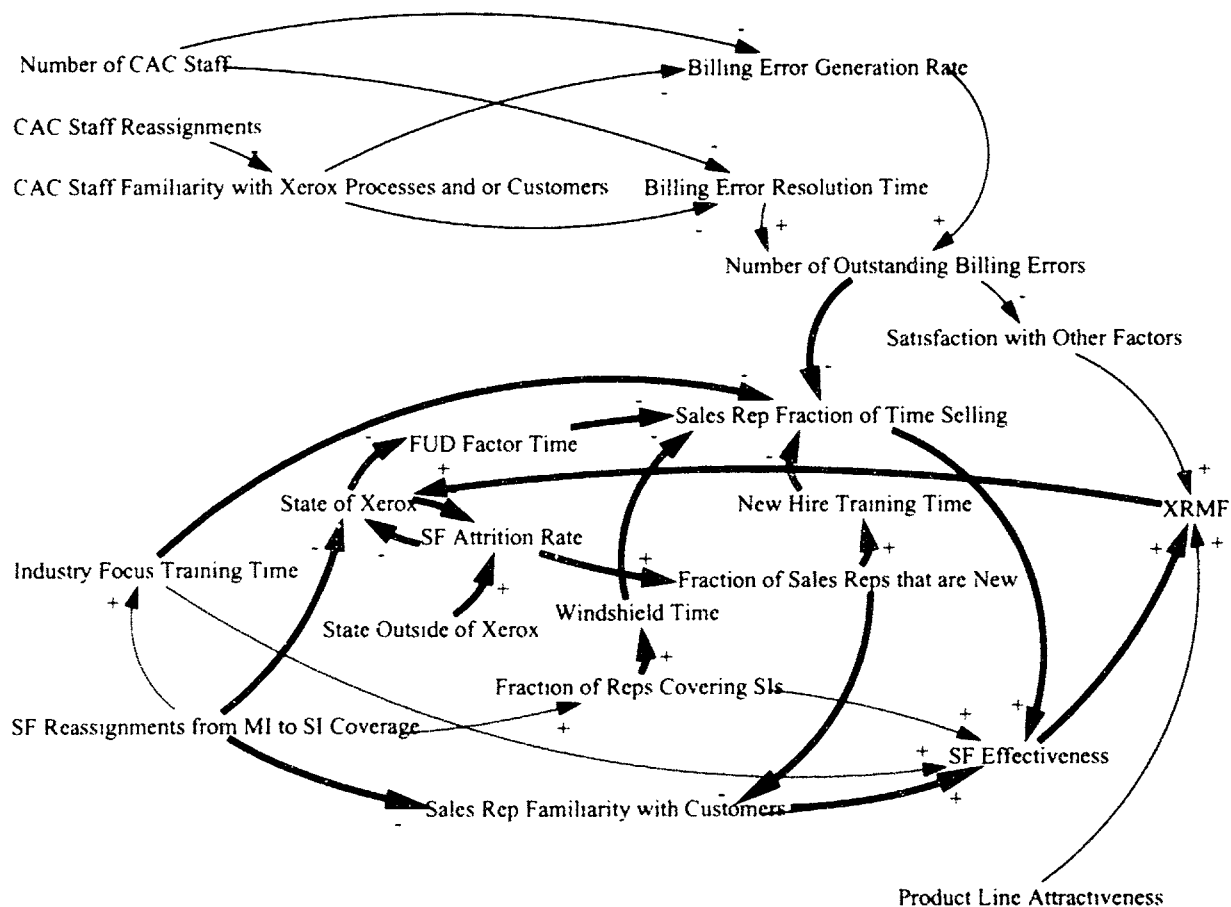


Figure 56: Causal Relationships - Full System



As the bold arrows suggest, the key factors that perhaps were not given adequate consideration centered around the allotment of time of the sales reps and the combined effects of the state of Xerox (as measured by the XRMF) and of the outside world on the sales force attrition rate. A number of these – those within just the sales force reorganization portion – have already been discussed. However, additional effects resulted from the interaction of the three major factors analyzed in this thesis.

Consider first if all that had happened had been the CAC reorganization. As it progressed customers would have noticed increased billing errors (and probably a number of other negative things) ultimately attributable to the newness and/or unfamiliarity of the CAC staff with them and the increased workload that the CAC staff was under. This would have caused some lowering of the XRMF, most likely among those Xerox customers who had recently experienced increased dissatisfaction with the “other factors” of Xerox and were in need of replacing some of their equipment. While this would not have been good news for Xerox (nor would have been the loss of revenue due to lost receivables), in hindsight it would have been something far more desirable than what actually happened.

Next consider the interaction of the CAC and sales force reorganizations. As already mentioned, as the number of billing (and probably other) errors went up, certain customers’ satisfaction with the “other factors” of Xerox went down (those customers with recent Xerox experience who were in need of replacing equipment), thus lowering the XRMF. However, in addition to this, as the fraction of customers with unresolved billing errors increased sales reps spent less time selling since they had to spend more of their time trying to resolve these problems, thus lowering sales force effectiveness. This also resulted in customers not opting to go with Xerox (i.e. the XRMF went lower) but in this case it was for customers who might not have even experienced any increases in their billing errors. In other words, the interaction likely affected two different groups of customers and probably over two different timeframes as well. One must then realize that as the XRMF went down for either of these two causal pathways this fed back to further lower the perceived state of Xerox among the sales reps, reinforcing some of the sales force reorganization loops already discussed.

Next, consider the effects of the relative deterioration of the Xerox product line. Its presence alone was likely already enough to cause a significant erosion of Xerox’ market share. However, when its effects on XRMF are fed back through the sales force reorganization pathways and loops, its effects were magnified. Add to that the fact that there were two other major factors playing into the lowering of the XRMF and one can begin to see how all of these effects interacted.

Finally, consider the timing of all three of these effects. Note that all were essentially “bottoming out” within no more than two years of each other. In reality, I assume that all customers were fully cognizant of two of the three factors – the sales rep effectiveness and the product line deterioration. I also assume that the majority of customers probably also had at least some experience with the effects of the CAC reorganization (note that in the model I actually assume that all customers were fully cognizant of all three factors). Given this, consider a customer’s decision making process. If they only perceive one of these three dimensions to be unsatisfactory then it seems reasonable to me that their likelihood to purchase from Xerox will be roughly linearly proportional to their level of dissatisfaction with that one dimension, at least within some practical range of their “normal” satisfaction level. However, if they perceive that two or three dimensions are dissatisfactory – something entirely possible given the timing of the

factors – then it also seems reasonable to me that a customer will be less likely to purchase from Xerox than the sum of their reduced likelihoods for any single reason taken alone. This is because they might be willing to “forgive,” or at least not judge as harshly, a vendor for one area of dissatisfaction much more readily than if they think that vendor is undesirable for two or more reasons. It is this rationale that I believe customers use when making their purchasing decisions and it is the rationale I have codified in my model. This decision-making mentality, in combination with the interactions within and among the three primary effects already mentioned, are what I believe were the ultimate causes of Xerox’ decline at the turn of the millennium.

### 15.3 Suggested Enhancements

There are a number of enhancements that one might make to this model and this analysis so that it might more accurately depict reality. In addition, there were a number of other factors going on at the same time as the primary ones considered in this thesis that also likely had an effect on Xerox’ decline. In no particular order I will briefly list these here without much additional commentary to provide the reader with a more comprehensive understanding of the actual dynamics involved and the context of Xerox’ situation.

- First, one could add in non-zero values for the creation and/or disappearance of slots. One would obviously want to base the net change in the number of slots on actual data and/or projections from those familiar with the industry. One would additionally have to split the creation and/or disappearance appropriately between Xerox and its competition. Secondly, one might want to have the average system lives in the field, and possibly the delivery times, be variables. Some of the factors that could influence how these variables might change are already in the model and others may have not yet been discussed.
- Higher order aging chains, in particular in the market slot dynamics and sales rep familiarity chains, might be more realistic.
- Given the difference in sales cycle time, price, and revenue impacts (among other factors) between mid-range and high-end products one might want to disaggregate the model by market segment, especially if one wanted to model financial metrics.
- Another key element not explicitly modeled here but which might have been a real factor was the interrelationship between the actions, state, and policies of Xerox and its competitors. For instance, at the same time the Xerox sales force was in turmoil, did competitors sense this and “pounce” on customers more aggressively because they knew Xerox was weak? There are probably many more examples of this type of dynamic cross-coupling that could be added.
- One factor that somewhat concerns me about my particular formulation for the XRMF is that it has no inherent “inertia” associated with it. In other words, if all else in the model were exactly equal except for one factor being in favor of one vendor, and if this remained exactly the case forever, in equilibrium one would expect that ultimately that vendor would take over the entire market. The formulation here does not allow this. However, given that the circumstances already mentioned for this to take place are no where near realistic in and of themselves, this is more of an academic fine point than any sort of important model omission.

- Note that one major loop not included here (primarily because it could be the subject of an entire thesis itself) is that product line attractiveness is ultimately related in large part to the financial health of the company. In other words, as Xerox lost market share and revenues (and therefore product development funding) were reduced, this ultimately contributed to a weaker product portfolio, reinforcing the negative spiral. Note that as of this writing the full timeframe to see these effects may not yet have played itself out since major product development cycles at Xerox are on the order of more than a couple of years.
- Another factor that could be included here are the balancing feedback loops that management instituted as they began to see what was going on – things like altering the sales rep compensation structure to stem attrition and ramping the CAC staff levels back up to levels higher than the original consolidation plan called for. These actions might have made the market share losses predicted in this model less severe but again note that this model would not have directly accounted for the cost of implementing them.
- Finally, there were a number of other Xerox and exogenous events going on at the same time as the issues described here. Xerox decided to get into the personal inkjet printer business and spent tremendous amounts of cash trying to develop an installed base of machines that would eventually drive increased consumables revenue. However, it was competing directly against HP and it was doing so as the tech sector collapsed and, to some degree, personal spending in the PC peripheral arena similarly collapsed. Xerox eventually exited this business in 2001. Brazil, traditionally a large revenue generator for Xerox, experienced an economic collapse. Certain Xerox managers engaged in questionable financial accounting procedures that ultimately resulted in an SEC investigation and the changing of Xerox' external auditors. The list goes on but this is all I will cover here.

*DN*

## **Appendix A – A Very Brief Overview of the Field of System Dynamics**

The following excerpt from the home page of the System Dynamics Society<sup>95</sup> provides an introductory overview of the field of system dynamics:

*“System dynamics is a methodology for studying and managing complex feedback systems, such as one finds in business and other social systems. In fact it has been used to address practically every sort of feedback system. While the word system has been applied to all sorts of situations, feedback is the differentiating descriptor here. Feedback refers to the situation of X affecting Y and Y in turn affecting X perhaps through a chain of causes and effects. One cannot study the link between X and Y and, independently, the link between Y and X and predict how the system will behave. Only the study of the whole system as a feedback system will lead to correct results.*

*The methodology identifies a problem,*

- *develops a dynamic hypothesis explaining the cause of the problem,*
- *builds a computer simulation model of the system at the root of the problem,*
- *tests the model to be certain that it reproduces the behavior seen in the real world,*
- *devises and tests in the model alternative policies that alleviate the problem, and*
- *implements this solution.*

*Rarely, is one able to proceed through these steps without reviewing and refining an earlier step. For instance, the first problem identified may only be a symptom of a still greater problem.*

*The field developed initially from the work of Jay W. Forrester. His seminal book Industrial Dynamics (Forrester 1961) is still a significant statement of philosophy and methodology in the field. Since its publication, the span of applications has grown extensively and now encompasses work in*

- *corporate planning and policy design*
- *public management and policy*
- *biological and medical modeling*
- *energy and the environment*
- *theory development in the natural and social sciences*
- *dynamic decision making*
- *complex nonlinear dynamics”*

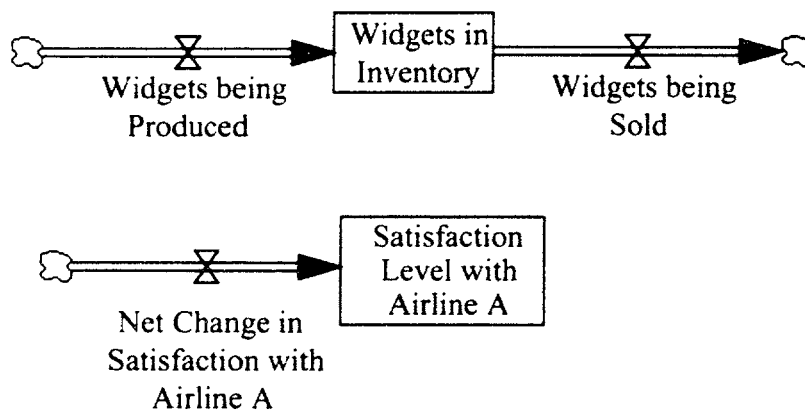
The reader unfamiliar with the field should also be aware of the key elements of the diagramming conventions used in the field. Simplistically speaking, there are two basic concepts and associated symbols – the “stock” and the “flow.” A stock (sometimes called a level) is a quantity that, if the system were frozen in time, would be able to be measured. Examples include not only physical quantities such as “widgets in inventory” or “sales reps unfamiliar with their customers” but also such unphysical quantities as “satisfaction level with airline A” or

---

<sup>95</sup> <http://www.albany.edu/cpr/sds/index.html>

“likelihood to purchase a printer from vendor B.” In system dynamics diagrams stocks are typically represented by a rectangular box.

A flow (sometimes called a rate) is what changes a stock. Flows entering and exiting a particular stock must have units of the unit of the stock divided by time (in particular, divided by the master unit of time assumed for the entire model such as “months”). Corresponding examples of flows for the stocks mentioned earlier might include “widgets being produced,” “sales reps gaining familiarity with their customers,” “net change in satisfaction with airline A,” and “increase in likelihood of purchasing from vendor B.” Flows are represented with a symbol meant to represent a pipe with a valve. Some simple examples follow. Note that a cloud symbol represents a flow originating from, or going to, a domain beyond the specific boundary of the model considered.



The two fundamental concepts of stock and flow are inherently related. Mathematically, stocks are the integrals of the flows (and system dynamics software performs these integrations numerically). Less mathematically speaking, stocks represent the net accumulation of all of the flows entering and exiting them. Additionally, it should be noted that the actual value of all flows in a system dynamics model ultimately are based on the value of one, some, or all of the stocks in the model. It is in this fact that the ability of system dynamics models to capture feedback is enabled.

Finally, it should be noted that in addition to the stocks and flows in a system dynamics model, such models also typically include a large number of other variables. These variables represent constants (for instance, number of hours per week available for a sales rep), parameters (such as average delay times), auxiliary variables, and intermediate calculations often necessary to complete the model or to make it more clear.

## **Appendix B – Additional References**

*In addition to the references already specifically cited throughout this document, the following were also consulted as a part of general background research and reading. Within each section references are listed in chronological order.*

### **Readings on System Dynamics**

Forrester, Jay W. *Industrial Dynamics*, Pegasus Communications, Inc., Waltham, MA, 1999 (Originally published by MIT Press, Cambridge, MA, 1961).

Forrester, Jay W. “Market Growth as Influenced by Capital Investment.” *Collected Papers of Jay W. Forrester*, Productivity Press, Portland, OR, 1975, p. 111 (Originally published by MIT Press, Cambridge, MA and originally appearing in *Industrial Management Review* (currently *Sloan Management Review*) 9, no. 2 (Winter 1968), pp. 83 – 105).

Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin McGraw-Hill, Boston, 2000.

Hines, Jim. Lecture Notes, *System Dynamics: Managing Complexity*, Course 15.982, System Design and Management Program, Massachusetts Institute of Technology, Summer 2000.

Hines, Jim. Lecture Notes, *System Dynamics II*, Course 15.876, Sloan School of Management, Massachusetts Institute of Technology, Fall 2000.

### **Readings on Xerox**

*Today at Xerox* (Internal Xerox email newsletter), various editions, 1995 – 2001.

*Weblines* (Internal Xerox electronic news bulletin board), various editions, 1997 – 2000.

*Management Communiqué* (Internal Xerox management newsletter), various editions, 1998 – 2000.

“We’re Going to be the Firm to Watch.” Contavespi, Vicki, *Forbes.com*, September 24, 1998.

“The Xerox Machine is Broken.” Einstein, David, *Forbes.com*, January 6, 2000.

“Xerox Jam is too Much for Thoman.” Kupfer, Andrew, *Fortune*, May 29, 2000.

“Xerox’s Paper Tiger.” *The Economist*, October 7, 2000, p. 78.

“The Paper Jam from Hell: It’s Another Near-Death Experience and Another Turnaround Plan for the No. 1 Copier Company. Hey, Can Anyone Manage Xerox?” Kahn, Jeremy and Schlosser, Julie, *Fortune*, November 13, 2000, p. 141.

“It’s the Business Model, Stupid!” Colvin, Geoffrey, *Fortune*, January 8, 2001, p. 54.

“Downfall: The Inside Story of the Management Fiasco at Xerox.” Bianco, Anthony and Moore, Pamela A., *BusinessWeek*, March 5, 2001, p. 82.

“HR Woes at Xerox.” Grossman, Robert J., *HR Magazine*, May 2001, p. 34.

Discussions with the Author on Xerox

Baumann, Laura M., Account Manager, Xerox of Upstate New York, September 16, 1999.

Teixeira, Bruce, District System Sales Manager, Printing Systems Group, New England Operations, June 20, 2001.

Sutherland, Lorraine R., Printing Solutions Marketing Executive, USCO, July 30, 2001.

Fallon, Peter, Marketing Manager, Monochrome Business Unit, October 3, 2001.

## **Appendix C – Full Model – Text Mode Format**

Total Attractiveness of Xerox Product Line=

IF THEN ELSE(Product Line Attractiveness Profile Switch=1, Lookup Table for Total Attractiveness of Xerox Product Line 1 Mild Deterioration

(Time \* Conversion Factor from Months to Dmnl Time), Lookup Table for Total Attractiveness of Xerox Product Line 2 Significant Deterioration

(Time \* Conversion Factor from Months to Dmnl Time))

~ Dmnl

~ |

Additional Time for Customer Admin Issues due to Customer Admin Center Reorg=

Lookup Table for Effect of Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg\

(Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg\

)

~ Hours/Week

~ |

Lookup Table for Effect of Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg\

(

[(0,0)-(7,15)],(0,0),(0.5,0.263158),(1,1),(1.5,2.5),(2,4.5),(3,9),(4,12),(5,14),(6,14.7\), (7,15))

~ Hours/Week

~ |

Xerox Retention and Migration Fraction=

Xerox Fraction of Total Effectiveness Attractiveness and Satisfaction

~ Dmnl

~ |

Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors\



(  
 [(0,0)-(2,5)],(0,5),(0.2,3),(0.4,2),(0.6,1.5),(0.8,1.2),(1,1),(1.2,0.88),(1.4,0.82),\  
 (1.6,0.77),(1.8,0.73),(2,0.7))  
 ~ Dmnl  
 ~ |

Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation Rate\

(  
 [(0,0)-(2,5)],(0,5),(0.2,3),(0.4,2),(0.6,1.5),(0.8,1.2),(1,1),(1.2,0.88),(1.4,0.82),\  
 (1.6,0.77),(1.8,0.73),(2,0.7))  
 ~ Dmnl  
 ~ |

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors\

(  
 [(0,0)-(15,2)],(0,0.8),(0.25,0.88),(0.5,0.94),(0.75,0.97),(1,1),(2,1.06),(5,1.15),(10\  
 ,1.25),(15,1.3))  
 ~ Dmnl  
 ~ |

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation Rate\

(  
 [(0,0)-(15,2)],(0,0.8),(0.25,0.88),(0.5,0.94),(0.75,0.97),(1,1),(2,1.06),(5,1.15),(10\  
 ,1.25),(15,1.3))  
 ~ Dmnl  
 ~ |

Fraction of Customers with Undetected Billing Errors= INTEG (  
 Creating Billing Errors - Detecting Billing Errors,  
 0.0169)

~ Fraction  
~ |

Average Time to Resolve Billing Errors=

Normal Average Time to Resolve Billing Errors \* Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors\

\* Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors

~ Months  
~ |

Detecting Billing Errors=

Fraction of Customers with Undetected Billing Errors / Average Time for Customers to Detect Billing Errors

~ Fraction/Month  
~ |

Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation Rate\

=

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation Rate\

(Ratio of All CAC Staff Unfamiliar with their Customers Current vs at Start of CAC Reorg\

.

~ Dmnl  
~ |

Lookup Table for Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox\

(  
[(0,0)-(15,2)],(0,1.1),(0.25,1.06),(0.5,1.03),(0.75,1.01),(1,1),(15,0.6))

~ Dmnl  
~ |

Ratio of Actual Number of All CAC Staff Current vs at Start of CAC Reorg=

IF THEN ELSE(Snapshot of Actual Number of All CAC Staff at Start of CAC Reorg=0,  
1, \

(Actual Number of All CAC Staff / Snapshot of Actual Number of All CAC Staff  
at Start of CAC Reorg\

))

~ Dmnl

~ |

Normal Billing Error Creation Rate=

0.017

~ Fraction/Month

~ |

Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors\

=

Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Average Time  
to Resolve Billing Errors\

(Ratio of Actual Number of All CAC Staff Current vs at Start of CAC Reorg)

~ Dmnl

~ |

Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation Rate=

Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Billing Error  
Creation Rate\

(Ratio of Actual Number of All CAC Staff Current vs at Start of CAC Reorg)

~ Dmnl

~ |

Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve  
Billing Errors\

=

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on  
Average Time to Resolve Billing Errors\

(Ratio of All CAC Staff Unfamiliar with their Customers Current vs at Start of  
 CAC Reorg\  
 )  
 ~ Dmnl  
 ~ |

Resolving Billing Errors=

Fraction of Customers with Detected but Unresolved Billing Errors / Average Time to  
 Resolve Billing Errors  
 ~ Fraction/Month  
 ~ |

Billing Error Creation Rate=

Normal Billing Error Creation Rate \* Effect of Ratio of All CAC Staff Unfamiliar with  
 their Customers on Billing Error Creation Rate\  
 \* Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation  
 Rate  
 ~ Fraction/Month  
 ~ |

Normal Average Time to Resolve Billing Errors=

1.5  
 ~ Months  
 ~ |

Snapshot of Fraction of Customers with Detected but Unresolved Billing Errors at Start of CAC Reorg\  
 =SAMPLE IF TRUE(  
 Time=Time Customer Admin Center Reorg is Initiated, Fraction of Customers with  
 Detected but Unresolved Billing Errors\  
 , 0)  
 ~ Fraction  
 ~ |

Average Time for Customers to Detect Billing Errors=

1  
~ Months  
~ |

Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox\

=

Lookup Table for Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox\

(Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg\

)  
~ Dmnl  
~ |

Total Satisfaction with Other Factors of Xerox=

Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox\

\* Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox

~ Dmnl  
~ |

Fraction of Customers with Detected but Unresolved Billing Errors= INTEG (

Detecting Billing Errors - Resolving Billing Errors,

0.0254)  
~ Fraction  
~ |

Creating Billing Errors=

Billing Error Creation Rate

~ Fraction/Month  
~ |

Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg\

=

IF THEN ELSE(Snapshot of Fraction of Customers with Detected but Unresolved Billing Errors at Start of CAC Reorg\

=0, 1, Fraction of Customers with Detected but Unresolved Billing Errors / Snapshot of Fraction of Customers with Detected but Unresolved Billing Errors at Start of CAC Reorg\

)

~ Dmnl

~ |

Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox\

=

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox\

(Ratio of All CAC Staff Unfamiliar with their Customers Current vs at Start of CAC Reorg\

)

~ Dmnl

~ |

Absolute CAC Staff Leaving Rate during CAC Reorg=

IF THEN ELSE(Fraction of CAC Reorg Duration Elapsed since CAC Reorg Initiation>0, ((\

Total Number of CAC Staff Leaving Xerox over Duration of CAC Reorg / Duration of Customer Admin Center Reorg) \* Lookup Table for Profile of CAC Reorg(\

Fraction of CAC Reorg Duration Elapsed since CAC Reorg Initiation

)), 0)

~ Staff/Month

~ |

Actual Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC Reorg=

0.25

~ Dmnl

~ |

Actual Additional Number of All CAC Staff Leaving Xerox over Duration of CAC Reorg=

Snapshot of Actual Number of All CAC Staff at Start of CAC Reorg \* Actual Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC Reorg

~ Staff

~ |

Actual CAC Staff Fractional Reassignment Rate=

IF THEN ELSE(CAC Reorg Phase=2, CAC Staff Fractional Reassignment Rate before and after CAC Reorg\

\* Ratio of CAC Staff Fractional Reassignment Rate during CAC Reorg to that Not during CAC Reorg\

, CAC Staff Fractional Reassignment Rate before and after CAC Reorg)

~ Fraction/Month

~ |

Ratio of CAC Staff Fractional Reassignment Rate during CAC Reorg to that Not during CAC Reorg\

=

5

~ Dmnl

~ |

Anticipated Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC Reorg since they Do Not Relocate\

=

0.1

~ Dmnl

~ |

Anticipatory Hiring of New CAC Staff=

IF THEN ELSE(CAC Reorg Phase=2, ((Snapshot of Actual Number of All CAC Staff at Start of CAC Reorg\

\* Anticipated Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC Reorg since they Do Not Relocate\

) / Duration of Customer Admin Center Reorg) \* Lookup Table for Profile of CAC Reorg\

(Fraction of CAC Reorg Duration Elapsed since CAC Reorg Initiation), 0)

~ Staff/Month

~ |

Reassignments of CAC Staff=

CAC Staff Familiar with their Customers \* Actual CAC Staff Fractional Reassignment Rate

~ Staff/Month

~ |

Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox\

(

[(0,0)-(15,2)],(0,1.1),(0.5,1.07018),(1,1),(2,0.91),(4,0.76),(6,0.65),(8,0.57),(10,0.5\), (12,0.44),(15,0.4))

~ Dmnl

~ |

Total Number of CAC Staff Leaving Xerox over Duration of CAC Reorg=

Target Number of All CAC Positions to Eliminate over Duration of CAC Reorg + Actual Additional Number of All CAC Staff Leaving Xerox over Duration of CAC Reorg

~ Staff

~ |

Snapshot of Fraction of All CAC Staff Unfamiliar with their Customers at Start of CAC Reorg\

=

SAMPLE IF TRUE(Time=Time Customer Admin Center Reorg is Initiated, Fraction of All CAC Staff Unfamiliar with their Customers\

, 0)



~ Fraction  
~ |

Current Desired Number of All CAC Staff=

IF THEN ELSE(CAC Reorg Phase<=2, Desired Number of All CAC Staff before CAC Reorg - \

(Target Number of All CAC Positions to Eliminate over Duration of CAC Reorg

\* Fraction of CAC Reorg Duration Elapsed since CAC Reorg Initiation), (Desired Number of All CAC Staff before CAC Reorg

- Target Number of All CAC Positions to Eliminate over Duration of CAC Reorg))

~ Staff

~ |

Ratio of All CAC Staff Unfamiliar with their Customers Current vs at Start of CAC Reorg\

=

IF THEN ELSE(Snapshot of Fraction of All CAC Staff Unfamiliar with their Customers at Start of CAC Reorg\

=0, 1, Fraction of All CAC Staff Unfamiliar with their Customers / Snapshot of Fraction of All CAC Staff Unfamiliar with their Customers at Start of CAC Reorg\

)

~ Dmnl

~ |

Normal Hiring of New CAC Staff=

MAX(0, (Current Desired Number of All CAC Staff - Actual Number of All CAC Staff) /\

Average Time Required to Find and Hire and Train New CAC Staff)

~ Staff/Month

~ |

Snapshot of Actual Number of All CAC Staff at Start of CAC Reorg=

SAMPLE IF TRUE(Time=Time Customer Admin Center Reorg is Initiated, Actual Number of All CAC Staff\

, 0)

~ Staff  
~ |

Desired Number of All CAC Staff before CAC Reorg=

1000  
~ Staff  
~ |

Lookup Table for Profile of CAC Reorg(

[(0,0)-(1,2)],(0,1),(1,1))  
~ Dmnl  
~ |

CAC Staff Fractional Reassignment Rate before and after CAC Reorg=

0.01  
~ Fraction/Month  
~ |

CAC Staff Leaving Xerox via Normal Attrition Path B=

CAC Staff Familiar with their Customers \* Normal Fractional CAC Attrition Rate  
~ Staff/Month  
~ |

CAC Staff Leaving Xerox due to CAC Reorg Path B=

MAX(0, IF THEN ELSE(CAC Reorg Phase=2, Absolute CAC Staff Leaving Rate during CAC Reorg\

\* (1 - Fraction of All CAC Staff Unfamiliar with their Customers), 0))  
~ Staff/Month  
~ |

CAC Staff Leaving Xerox via Normal Attrition Path A=

CAC Staff Unfamiliar with their Customers \* Normal Fractional CAC Attrition Rate  
~ Staff/Month

~ |

Gaining Familiarity with Customers for CAC Staff=

CAC Staff Unfamiliar with their Customers / Average Time to Gain Familiarity for CAC Staff

~ Staff/Month

~ |

CAC Staff Unfamiliar with their Customers= INTEG (

(Normal Hiring of New CAC Staff + Anticipatory Hiring of New CAC Staff + Reassignments of CAC Staff\

) - (Gaining Familiarity with Customers for CAC Staff + CAC Staff Leaving Xerox via Normal Attrition Path A\

+ CAC Staff Leaving Xerox due to CAC Reorg Path A),

28)

~ Staff

~ |

Normal Fractional CAC Attrition Rate=

0.02

~ Fraction/Month

~ |

Fraction of All CAC Staff Unfamiliar with their Customers=

CAC Staff Unfamiliar with their Customers / Actual Number of All CAC Staff

~ Fraction

~ |

CAC Staff Leaving Xerox due to CAC Reorg Path A=

MAX(0, IF THEN ELSE(CAC Reorg Phase=2, Absolute CAC Staff Leaving Rate during CAC Reorg\

\* Fraction of All CAC Staff Unfamiliar with their Customers, 0))

~ Staff/Month

~ |

CAC Staff Familiar with their Customers= INTEG (

Gaining Familiarity with Customers for CAC Staff - (Reassignments of CAC Staff +  
CAC Staff Leaving Xerox via Normal Attrition Path B\

+ CAC Staff Leaving Xerox due to CAC Reorg Path B),

933.53)

~ Staff

~ |

Average Time to Gain Familiarity for CAC Staff=

1

~ Months

~ |

Target Number of All CAC Positions to Eliminate over Duration of CAC Reorg=

Snapshot of Actual Number of All CAC Staff at Start of CAC Reorg \* Target Fraction of  
All CAC Positions to Eliminate over Duration of CAC Reorg

~ Staff

~ |

Total Satisfaction with Other Factors of Competition=

EXP(LN((1 / Initial Xerox Retention and Migration Fraction) - 1) / 3)

~ Dmnl

~ |

Duration of Customer Admin Center Reorg=

6

~ Months

~ |

Actual Number of All CAC Staff=

CAC Staff Unfamiliar with their Customers + CAC Staff Familiar with their Customers

~ Staff

~ |

Target Fraction of All CAC Positions to Eliminate over Duration of CAC Reorg=

0.25

~ Dmnl

~ |

CAC Reorg Phase=

IF THEN ELSE(Time<=Time Customer Admin Center Reorg is Initiated, 1, IF THEN ELSE(Time\

<=(Time Customer Admin Center Reorg is Initiated + Duration of Customer Admin Center Reorg\

), 2, 3))

~ Dmnl

~ |

Fraction of CAC Reorg Duration Elapsed since CAC Reorg Initiation=

IF THEN ELSE((Time>Time Customer Admin Center Reorg is Initiated) :AND: (Time<=(Time Customer Admin Center Reorg is Initiated\

+ Duration of Customer Admin Center Reorg)), (Time - Time Customer Admin Center Reorg is Initiated\

) / Duration of Customer Admin Center Reorg, 0)

~ Dmnl

~ |

Average Time Required to Find and Hire and Train New CAC Staff=

2

~ Months

~ |

Lookup Table for Total Attractiveness of Xerox Product Line 1 Mild Deterioration(

[(0,0)-(240,2)],(0,1),(12,1),(24,0.97),(36,0.95),(48,0.95),(60,0.97),(72,1),(84,1),(\

96,1),(108,1),(240,1))

~ Dmnl

~ |

Lookup Table for Total Attractiveness of Xerox Product Line 2 Significant Deterioration\

(  
 [(0,0)-(240,2)],(0,1),(12,0.97),(24,0.87),(36,0.79),(48,0.77),(60,0.79),(72,0.87),(84\  
 ,0.97),(96,1),(108,1),(240,1))

~ Dmnl

~ |

Product Line Attractiveness Profile Switch=

1

~ Dmnl

~ |

Total Effectiveness of Competitive Sales Force=

EXP(LN((1 / Initial Xerox Retention and Migration Fraction) - 1) / 3)

~ Dmnl

~ |

Total Attractiveness of Competitive Product Line=

EXP(LN((1 / Initial Xerox Retention and Migration Fraction) - 1) / 3)

~ Dmnl

~ |

Initial Xerox Retention and Migration Fraction Ratio=

INITIAL(Xerox Retention and Migration Fraction Ratio)

~ Dmnl

~ |

Xerox Retention and Migration Fraction Ratio=

IF THEN ELSE(Snapshot of Xerox Retention and Migration Fraction at Start of First  
 Reorg\

=0, 1, Xerox Retention and Migration Fraction / Snapshot of Xerox Retention and Migration Fraction at Start of First Reorg\

)  
 ~ Dmnl  
 ~ |

Perceived Xerox Retention and Migration Fraction Ratio= INTEG (  
 Change in Perceived Xerox Retention and Migration Fraction Ratio,  
 Initial Xerox Retention and Migration Fraction Ratio)

~ Dmnl  
 ~ |

Combined Xerox Effectiveness Attractiveness and Satisfaction=  
 Total Effectiveness of Xerox Sales Force \* Total Attractiveness of Xerox Product Line\  
 \* Total Satisfaction with Other Factors of Xerox

~ Dmnl  
 ~ |

Total Effectiveness of Xerox Sales Force=  
 Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness \*\  
 Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness \*  
 Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness

~ Dmnl  
 ~ |

Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness=  
 Lookup Table for Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness\  
 Effectiveness\

(Ratio of Xerox Sales Rep Single Industry Coverage Current vs at Start of SF  
 Reorg)

~ Dmnl  
 ~ |

Initial Xerox Retention and Migration Fraction=

0.3

~ Dmnl

~ |

Lookup Table for Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness\

(  
[(0,0)-(3,2)],(0,0.6),(0.25,0.75),(0.5,0.855),(0.75,0.935),(1,1),(1.333,1.07),(1.667\

~ Dmnl

~ |

Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate= INTEG\

(  
Change in Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition  
Rate\

,  
1)  
~ Dmnl

~ |

Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness=

Lookup Table for Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness\

(Ratio of Actual Fraction of Time Selling Current vs at Start of First Reorg)  
~ Dmnl  
~ |

Effect of Internally Perceived State of the World Outside Xerox on SF Attrition Rate=

Lookup Table for Effects on SF Attrition Rate(Internally Perceived State of the World Outside Xerox\

)  
~ Dmnl

~ |



Actual Fractional SF Attrition Rate=

Normal Fractional SF Attrition Rate \* Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate

~ Fraction/Month

~ |

Change in Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\

=

IF THEN ELSE((Implied Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\

- Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\



- Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\

) / Delay in Raising SF Attrition Rate, (Implied Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\

- Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate\

) / Delay in Lowering SF Attrition Rate)

~ Dmnl/Month

~ |

Initial Time per Week on Overhead Activities= ACTIVE INITIAL (

Required Time per Week on Overhead,

9.19207)

~ Hours/Week

~ |

Ratio of Actual Fraction of Time Selling Current vs at Start of First Reorg=

IF THEN ELSE(Snapshot of Actual Fraction of Time Selling at Start of First Reorg=0, \ 1, Actual Fraction of Time Selling / Snapshot of Actual Fraction of Time Selling at Start of First Reorg\

)  
 ~ Dmnl  
 ~ |

Net Change in Customer Admin Issues Time per Week=

((Required Time per Week Addressing Customer Admin Issues - Time per Week  
 Addressing Customer Admin Issues\  
 ) / Average Schedule Adjustment Time) \* Lookup Table for Limiting Increases  
 based on Fraction of Time Already Allotted\  
 (Fraction of Available Time Already Allotted)  
 ~ Hours/(Month\*Week)  
 ~ |

Net Change in Overhead Activities Time per Week=

((Required Time per Week on Overhead - Time per Week on Overhead Activities) /  
 Average Schedule Adjustment Time\  
 ) \* Lookup Table for Limiting Increases based on Fraction of Time Already  
 Allotted\  
 Fraction of Available Time Already Allotted)  
 ~ Hours/(Month\*Week)  
 ~ |

Snapshot of Actual Fraction of Time Selling at Start of First Reorg=SAMPLE IF TRUE(

Time=MIN(Time Customer Admin Center Reorg is Initiated, Time Sales Force Reorg is  
 Initiated\  
 ), Actual Fraction of Time Selling, 0)  
 ~ Fraction  
 ~ |

Lookup Table for Effect of Ratio of Fraction of Time Selling on Xerox Sales Force  
 Effectiveness\  
 (

[(0,0)-(2,2)],(0,0),(0.01,0.014),(0.02,0.028),(0.03,0.041),(0.04,0.055),(0.05,0.068)\  
 ,(0.06,0.082),(0.07,0.095),(0.08,0.108),(0.09,0.121),(0.1,0.134),(0.15,0.198),(0.2,\

0.26),(0.3,0.376),(0.4,0.485),(0.5,0.587),(0.6,0.681),(0.7,0.769),(0.8,0.852),(0.9,\  
0.928),(1,1),(1.1,1.067),(1.2,1.129),(1.3,1.187),(1.4,1.241),(1.5,1.291),(1.6,1.338\  
) , (1.7,1.382),(1.8,1.423),(1.9,1.461),(2,1.497))

~ Dmnl

~ |

Fraction of Available Time Already Allotted=

Total Non Selling Time per Week Already Allotted / Total Time per Week Available per  
Xerox Sales Rep

~ Dmnl

~ |

Lookup Table for Limiting Increases based on Fraction of Time Already Allotted(

[(0,0)-(1,1)],(0,1),(0.8,1),(0.85,0.99),(0.875,0.97),(0.9,0.95),(0.925,0.9),(0.95,0.75\  
) , (1,0))

~ Dmnl

~ |

Implied Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate=

Effect of Internally Perceived State of Xerox on SF Attrition Rate \* Effect of Internally  
Perceived State of the World Outside Xerox on SF Attrition Rate

~ Dmnl

~ |

SF Reps Leaving Xerox Path B=

Xerox Sales Reps Covering a Single Industry and Familiar with their Customers \* Actual  
Fractional SF Attrition Rate

~ Reps/Month

~ |

Effect of Internally Perceived State of Xerox on SF Attrition Rate=

Lookup Table for Effects on SF Attrition Rate(3 - Internally Perceived State of Xerox\  
)

~ Dmnl  
~ |

Delay in Lowering SF Attrition Rate=

0.25  
~ Months  
~ |

Delay in Raising SF Attrition Rate=

3  
~ Months  
~ |

Time per Week on Overhead Activities= INTEG (

Net Change in Overhead Activities Time per Week,  
Initial Time per Week on Overhead Activities)  
~ Hours/Week  
~ |

Additional Average Time per Week due to FUD Factor=

Lookup Table for Effect of Internally Perceived State of Xerox on Average Time per Week due to FUD Factor\

(Internally Perceived State of Xerox)  
~ Hours/Week  
~ |

Conversion Factor from Months to Dmnl Time=

1  
~ 1/Month  
~ |

Internally Perceived State of the World Outside Xerox=

Lookup Table for Perceived State of the World Outside Xerox(Time \* Conversion Factor  
from Months to Dmnl Time\

)  
~ Dmnl  
~ |

Lookup Table for Effect of Internally Perceived State of Xerox on Average Time per Week due  
to FUD Factor\

(  
[(0,0)-(3,10)],(0,10),(0.2,5.5),(0.4,2.75),(0.6,1.2),(0.8,0.3),(0.9,0.1),(1,0),(3,0)\  
)  
~ Hours/Week  
~ |

Lookup Table for Effects on SF Attrition Rate(

[(0,0)-(3,2)],(0,0),(0.01,0.016),(0.02,0.031),(0.03,0.047),(0.04,0.062),(0.05,0.077)\  
,(0.06,0.092),(0.07,0.107),(0.08,0.122),(0.09,0.136),(0.1,0.151),(0.15,0.22),(0.2,0.287\  
,(0.3,0.41),(0.4,0.522),(0.5,0.622),(0.6,0.714),(0.7,0.796),(0.8,0.871),(0.9,0.939\  
,(1,1),(1.1,1.055),(1.2,1.105),(1.3,1.151),(1.4,1.192),(1.5,1.229),(1.6,1.263),(1.7\  
,1.293),(1.8,1.32),(1.9,1.345),(2,1.368),(2.1,1.388),(2.2,1.407),(2.3,1.423),(2.4,1.438\  
,(2.5,1.452),(2.6,1.464),(2.7,1.476),(2.8,1.486),(2.9,1.495),(3,1.503))  
~ Dmnl  
~ |

Internally Perceived State of Xerox due to Perceived Total Absolute Reassignment Rate\

=

Lookup Table for Effect of Perceived Total Absolute Reassignment Rate Ratio on  
Internally Perceived State of Xerox\

(Perceived Total Absolute Reassignment Rate Ratio)  
~ Dmnl  
~ |

Lookup Table for Effect of Perceived Total Absolute Reassignment Rate Ratio on Internally Perceived State of Xerox\

(  
 [(0,0)-(5,2)],(0,1.1),(0.5,1.075),(1,1),(1.5,0.875),(2,0.75),(2.5,0.65),(3,0.58),(4,  
 0.5),(5,0.45))  
 ~ Dmnl  
 ~ |

Internally Perceived State of Xerox=

Internally Perceived State of Xerox due to Perceived Xerox Retention and Migration Fraction\

\* Internally Perceived State of Xerox due to Perceived Total Absolute Reassignment Rate

~ Dmnl  
 ~ |

Internally Perceived State of Xerox due to Perceived Xerox Retention and Migration Fraction\  
 =

Lookup Table for Effect of Perceived Xerox Retention and Migration Fraction Ratio on Internally Perceived State of Xerox\

(Perceived Xerox Retention and Migration Fraction Ratio)  
 ~ Dmnl  
 ~ |

Actual Fraction of Time Required for Industry Focus Training over Course of SF Reorg=

IF THEN ELSE(Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation>0, Average Fraction of Time Required for Industry Focus Training over Duration of SF Reorg\

\* Lookup Table for Profile of SF Reorg(Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation\  
 ), 0)

~ Dmnl  
 ~ |

Perception Delay for Xerox Retention and Migration Fraction=

1  
 ~ Months  
 ~ |

Initial New Hiring Rate=

INITIAL(Hiring New Xerox Sales Reps)  
 ~ Reps/Month  
 ~ |

Average Travel Time per Week=

Lookup Table for Average Travel Time per Week as a Function of Fraction of SI Coverage\  
 (Fraction of All Xerox Sales Reps Covering Single Industries)  
 ~ Hours/Week  
 ~ |

Initial Total Absolute Reassignment Rate=

INITIAL(Total Absolute Reassignment Rate Ratio)  
 ~ Dmnl  
 ~ |

Change in Perceived Total Absolute Reassignment Rate Ratio=

(Total Absolute Reassignment Rate Ratio - Perceived Total Absolute Reassignment Rate Ratio\  
 ) / Perception Delay for Total Absolute Reassignment Rate Ratio  
 ~ Dmnl/Month  
 ~ |

Change in Perceived Xerox Retention and Migration Fraction Ratio=

(Xerox Retention and Migration Fraction Ratio - Perceived Xerox Retention and Migration Fraction Ratio\  
 ) / Perception Delay for Xerox Retention and Migration Fraction  
 ~ Dmnl/Month

~ |

Fraction of All Xerox Sales Reps in New Hire Training=

Number of Xerox Sales Reps in New Hire Training / Actual Number of All Xerox Sales Reps

~ Dmnl

~ |

Additional Average Time per Week Required for Industry Focus Training=

Actual Fraction of Time Required for Industry Focus Training over Course of SF Reorg\  
\* Total Time per Week Available per Xerox Sales Rep

~ Hours/Week

~ |

Additional Industry Focus Training Time Required for SF Reorg=

0.5

~ Months

~ |

Snapshot of Xerox Retention and Migration Fraction at Start of First Reorg=SAMPLE IF TRUE\  
(

Time=MIN(Time Customer Admin Center Reorg is Initiated, Time Sales Force Reorg is Initiated\  
)

), Xerox Retention and Migration Fraction, 0)

~ Dmnl

~ |

Normal Average Non Travel and Non New Hire Training Overhead Time per Week=

3

~ Hours/Week

~ |

Average Fraction of Time Required for Industry Focus Training over Duration of SF Reorg\  
(



=

Additional Industry Focus Training Time Required for SF Reorg / Duration of Sales Force Reorg

~ Dmnl

~ |

Number of Xerox Sales Reps in New Hire Training= INTEG (

Going to Training - Going to Work,

Initial Number of Reps in New Hire Training)

~ Reps

~ |

Perceived Total Absolute Reassignment Rate Ratio= INTEG (

Change in Perceived Total Absolute Reassignment Rate Ratio,

Initial Total Absolute Reassignment Rate)

~ Dmnl

~ |

Average Time per Week for New Hire Training=

Total Time per Week Available per Xerox Sales Rep \* Fraction of All Xerox Sales Reps in New Hire Training

~ Hours/Week

~ |

Perception Delay for Total Absolute Reassignment Rate Ratio=

1

~ Months

~ |

Time Required for New Hire Training per Rep=

0.5

~ Months

~ |

Lookup Table for Effect of Perceived Xerox Retention and Migration Fraction Ratio on Internally Perceived State of Xerox\

(  
 [(0,0)-(2,2)],(0,0.325),(0.2,0.375),(0.4,0.45),(0.6,0.575),(0.8,0.75),(1,1),(1.2,1.25\  
 ),(1.4,1.425),(1.6,1.55),(1.8,1.625),(2,1.675))  
 ~ Dmnl  
 ~ |

Initial Number of Reps in New Hire Training=

Initial New Hiring Rate \* Conversion Factor from Reps per Month to Reps  
 ~ Reps  
 ~ |

Total Absolute Reassignment Rate=

Reassignments within Single Industries + Reassignments from Single to Multiple Industry Coverage\  
 + Reassignments from Multiple to Single Industry Coverage + Reassignments within Multiple Industries  
 ~ Reps/Month  
 ~ |

Required Time per Week on Overhead=

Normal Average Non Travel and Non New Hire Training Overhead Time per Week + Additional Average Time per Week Required for Industry Focus Training\  
 + Average Travel Time per Week  
 + Average Time per Week for New Hire Training  
 + Additional Average Time per Week due to FUD Factor  
 ~ Hours/Week  
 ~ |

Snapshot of Total Absolute Reassignment Rate at Start of First Reorg=SAMPLE IF TRUE(

Time=MIN(Time Customer Admin Center Reorg is Initiated, Time Sales Force Reorg is Initiated\  
 Initiated\

), Total Absolute Reassignment Rate, 0)  
 ~       Reps/Month  
 ~       |

Conversion Factor from Reps per Month to Reps=

1  
 ~       Month  
 ~       |

Lookup Table for Perceived State of the World Outside Xerox(

[(0,0)-(240,2)],(0,1),(0.002,1),(0.235,1),(0.469,1.002),(0.802,1.002),(1.01,1.005),(\n  
 1.269,1.008),(1.502,1.015),(1.71,1.025),(2.032,1.04),(2.258,1.05),(2.484,1.066),(2.71\n  
 ,1.082),(2.935,1.098),(3.169,1.113),(3.435,1.124),(3.669,1.136),(3.902,1.143),(4.142\n  
 ,1.152),(4.384,1.159),(4.602,1.164),(4.869,1.164),(5.069,1.162),(5.302,1.161),(5.535\n  
 ,1.156),(5.742,1.152),(6,1.155),(6.258,1.159),(6.484,1.165),(6.71,1.171),(6.935,1.175\n  
 ),(7.161,1.175),(7.387,1.173),(7.613,1.173),(7.839,1.165),(8.069,1.143),(8.402,1.122\n  
 ),(8.635,1.102),(8.869,1.088),(9.102,1.073),(9.335,1.057),(9.569,1.048),(9.802,1.043\n  
 ),(10.002,1.051),(10.235,1.068),(10.469,1.082),(10.677,1.099),(10.968,1.117),(11.194\n  
 ,1.142),(11.419,1.166),(11.645,1.185),(11.903,1.207),(12.177,1.228),(12.418,1.247),\n  
 (12.694,1.265),(12.935,1.281),(13.128,1.297),(13.397,1.308),(13.645,1.321),(13.968,\n  
 1.329),(14.194,1.334),(14.419,1.339),(14.645,1.347),(14.871,1.352),(15.135,1.358),(\n  
 15.369,1.371),(15.602,1.383),(15.835,1.4),(16.078,1.418),(16.328,1.431),(16.556,1.442\n  
 ),(16.769,1.451),(17.002,1.453),(17.235,1.455),(17.469,1.453),(17.702,1.458),(17.935\n

2\

,1.457),(18.202,1.466),(18.435,1.474),(18.645,1.483),(18.871,1.492),(19.097,1.497),\  
(19.323,1.497),(19.548,1.503),(19.774,1.511),(20.002,1.511),(20.269,1.511),(20.502,\  
1.506),(20.735,1.505),(20.97,1.502),(21.211,1.508),(21.453,1.511),(21.669,1.507),(21.90\  
,1.504),(22.102,1.51),(22.335,1.517),(22.548,1.533),(22.871,1.557),(23.129,1.583),\  
23.355,1.607),(23.581,1.642),(23.839,1.682),(24.065,1.718),(24.29,1.744),(24.548,1.771\  
,(24.774,1.791),(25.004,1.806),(25.246,1.824),(25.487,1.841),(25.71,1.851),(26,1.857\  
,(26.226,1.874),(26.452,1.886),(26.677,1.9),(26.903,1.923),(27.15,1.931),(27.4,1.927\  
,(27.581,1.908),(27.839,1.895),(28.097,1.873),(28.323,1.843),(28.548,1.818),(28.774\  
,1.769),(29.102,1.742),(29.335,1.727),(29.548,1.732),(29.774,1.738),(30.032,1.74),\  
30.29,1.748),(30.516,1.768),(30.742,1.787),(30.968,1.801),(31.194,1.802),(31.419,1.804\  
,(31.645,1.807),(31.871,1.817),(32.142,1.828),(32.384,1.828),(32.581,1.818),(32.806\  
,1.812),(33.065,1.81),(33.29,1.793),(33.516,1.767),(33.742,1.744),(33.969,1.717),(34.202\  
,1.694),(34.435,1.669),(34.669,1.641),(34.935,1.612),(35.177,1.59),(35.418,1.583),\  
35.613,1.561),(35.871,1.54),(36.194,1.513),(36.452,1.491),(36.677,1.482),(36.903,1.483\  
,(37.15,1.488),(37.4,1.478),(37.635,1.468),(37.869,1.461),(38.169,1.449),(38.402,1.433\  
,(38.635,1.402),(38.869,1.367),(39.069,1.326),(39.302,1.293),(39.548,1.274),(39.774\  
,1.266),(40.032,1.267),(40.258,1.269),(40.484,1.282),(40.71,1.305),(40.97,1.322),(41.211\  
,1.347),(41.453,1.359),(41.645,1.358),(41.871,1.357),(42.226,1.351),(42.452,1.343),\

\ (42.677,1.333),(42.903,1.32),(43.129,1.313),(43.355,1.301),(43.581,1.295),(43.806,1.287  
 ),(44.078,1.273),(44.543,1.257),(44.71,1.225),(44.968,1.197),(45.194,1.173),(45.419\  
 ,1.153),(45.645,1.136),(45.871,1.125),(46.102,1.113),(46.335,1.112),(46.569,1.127),\  
 (46.835,1.151),(47.507,1.17),(240,1.17))  
 ~ Dmnl  
 ~ |

Normal Time per Week Addressing Customer Admin Issues=

2  
 ~ Hours/Week  
 ~ |

Total Absolute Reassignment Rate Ratio=

IF THEN ELSE(Snapshot of Total Absolute Reassignment Rate at Start of First  
 Reorg=0,\  
 1, Total Absolute Reassignment Rate / Snapshot of Total Absolute Reassignment  
 Rate at Start of First Reorg\  
 )  
 ~ Dmnl  
 ~ |

Going to Training=

Hiring New Xerox Sales Reps  
 ~ Reps/Month  
 ~ |

Going to Work= DELAY FIXED (

Going to Training, Time Required for New Hire Training per Rep, Initial New Hiring  
 Rate\  
 )  
 ~ Reps/Month

~ |

Lookup Table for Average Travel Time per Week as a Function of Fraction of SI Coverage\

(  
[(0,0)-(1,8)],(0,4),(1,8))  
~ Hours/Week  
~ |

Snapshot of Actual Number of All Xerox Sales Reps at Start of SF Reorg=SAMPLE IF TRUE\

(  
Time=Time Sales Force Reorg is Initiated, Actual Number of All Xerox Sales Reps, 0)  
~ Reps  
~ |

Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of SF Reorg=SAMPLE IF TRUE\

(  
Time=Time Sales Force Reorg is Initiated, Fraction of All Xerox Sales Reps Covering  
Single Industries\  
, 0)  
~ Dmnl  
~ |

Snapshot of Fraction of All Xerox Sales Reps Unfamiliar with their Customers at Start of First Reorg\

=SAMPLE IF TRUE(  
Time=MIN(Time Customer Admin Center Reorg is Initiated, Time Sales Force Reorg is  
Initiated\  
, Fraction of All Xerox Sales Reps Unfamiliar with their Customers, 0)  
~ Fraction  
~ |

Actual Fraction of Time Selling=

Time per Week Selling / Total Time per Week Available per Xerox Sales Rep

~ Fraction  
~ |

Required Time per Week Addressing Customer Admin Issues=

Normal Time per Week Addressing Customer Admin Issues + Additional Time for  
Customer Admin Issues due to Customer Admin Center Reorg

~ Hours/Week  
~ |

Total Non Selling Time per Week Already Allotted=

Time per Week Addressing Customer Admin Issues + Time per Week on Overhead  
Activities

~ Hours/Week  
~ |

Average Schedule Adjustment Time=

0.5  
~ Months  
~ |

Time per Week Selling=

Total Time per Week Available per Xerox Sales Rep - Total Non Selling Time per Week  
Already Allotted

~ Hours/Week  
~ |

Time Customer Admin Center Reorg is Initiated=

4  
~ Months  
~ |

Time per Week Addressing Customer Admin Issues= INTEG (

Net Change in Customer Admin Issues Time per Week,

Normal Time per Week Addressing Customer Admin Issues)

~ Hours/Week

~ |

Total Time per Week Available per Xerox Sales Rep=

40

~ Hours/Week

~ |

Lookup Table for Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness\

(

[(0,0)-(5,2)],(0,1.2),(0.5,1.14),(1,1),(1.5,0.82),(2,0.66),(2.5,0.54),(3,0.44),(3.5,\  
0.35),(4,0.26),(4.5,0.21),(5,0.2))

~ Dmnl

~ |

Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness=

Lookup Table for Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness\

(Ratio of Xerox Sales Rep Unfamiliarity with Customers Current vs at Start of  
First Reorg\

)

~ Dmnl

~ |

Ratio of Xerox Sales Rep Single Industry Coverage Current vs at Start of SF Reorg=

IF THEN ELSE(Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of  
SF Reorg\

=0, 1, Fraction of All Xerox Sales Reps Covering Single Industries / Snapshot of  
Fraction of All Xerox Sales Reps Covering SIs at Start of SF Reorg\

)

~ Dmnl

~ |



Actual SI to SI and MI to MI Fractional Reassignment Rate=

IF THEN ELSE(Sales Force Reorg Phase=2, Normal SI to SI and MI to MI Fractional Reassignment Rate Not during SF Reorg\

\* Ratio of Average SI to SI and MI to MI Fractional Reassignment Rate during SF Reorg to that Not during SF Reorg\

\* Lookup Table for Profile of SF Reorg(Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation\

), Normal SI to SI and MI to MI Fractional Reassignment Rate Not during SF Reorg)

~ Fraction/Month

~ |

Ratio of Xerox Sales Rep Unfamiliarity with Customers Current vs at Start of First Reorg\

=

IF THEN ELSE(Snapshot of Fraction of All Xerox Sales Reps Unfamiliar with their Customers at Start of First Reorg\

=0, 1, Fraction of All Xerox Sales Reps Unfamiliar with their Customers / Snapshot of Fraction of All Xerox Sales Reps Unfamiliar with their Customers at Start of First Reorg\

)

~ Dmnl

~ |

Target Fraction of All Xerox Sales Reps to Reassign from MI to SI Coverage over Duration of SF Reorg\

=

IF THEN ELSE(Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of SF Reorg\

=0, 0, Target Fraction of All Xerox Sales Reps Covering Single Industries after SF Reorg\

- Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of SF Reorg)

~ Fraction

~ |

MI to SI Absolute Reassignment Rate during SF Reorg=

(Target Number of All Xerox Sales Reps to Reassign from MI to SI Coverage over  
Duration of SF Reorg\

/ Duration of Sales Force Reorg) \* Lookup Table for Profile of SF  
Reorg(Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation\

)

~       Reps/Month

~       |

Lookup Table for Profile of SF Reorg(

[(0,0)-(1,2)],(0,0.54),(0.45,0.54),(0.55,1),(0.65,1.4),(0.7,1.55),(0.75,1.65),(0.8,1.7\  
,)(0.85,1.7),(0.9,1.65),(0.95,1.55),(1,1.4))

~       Dmnl

~       |

Shortfall in Number of Xerox Sales Reps Covering Single Industries=

Target Number of All Xerox Sales Reps Covering Single Industries after SF Reorg -  
Actual Number of Xerox Sales Reps Covering Single Industries

~       Reps

~       |

MI to SI Absolute Reassignment Rate after SF Reorg=

Shortfall in Number of Xerox Sales Reps Covering Single Industries / Average Time to  
Make Reassignments after SF Reorg

~       Reps/Month

~       |

Target Number of All Xerox Sales Reps Covering Single Industries after SF Reorg=

Target Fraction of All Xerox Sales Reps Covering Single Industries after SF Reorg \* \  
Actual Number of All Xerox Sales Reps

~       Reps

~       |

Target Number of All Xerox Sales Reps to Reassign from MI to SI Coverage over Duration of SF Reorg\

=

Snapshot of Actual Number of All Xerox Sales Reps at Start of SF Reorg \* Target Fraction of All Xerox Sales Reps to Reassign from MI to SI Coverage over Duration of SF Reorg

~ Reps

~ |

Actual SI to MI Fractional Reassignment Rate=

IF THEN ELSE(Sales Force Reorg Phase=1, SI to MI Fractional Reassignment Rate before SF Reorg\

, IF THEN ELSE(Sales Force Reorg Phase=2, SI to MI Fractional Reassignment Rate before SF Reorg\

+ Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation \* ((SI to MI Fractional Reassignment Rate before SF Reorg\

\* Ratio of SI to MI Fractional Reassignment Rate after SF Reorg to that before SF Reorg\

) - SI to MI Fractional Reassignment Rate before SF Reorg), SI to MI Fractional Reassignment Rate before SF Reorg\

\* Ratio of SI to MI Fractional Reassignment Rate after SF Reorg to that before SF Reorg\

))

~ Fraction/Month

~ |

Xerox Market Share=

Total Number of Xerox Slots / Total Number of All Slots

~ Dmnl

~ |

Total Number of All Slots=

Slots Filled with Competitive Systems + Existing Competitive Slots Waiting for New Competitive Systems to Arrive\

+ New Competitive Slots Waiting for New Competitive Systems to Arrive + Slots Filled with Xerox Systems\

+ Existing Xerox Slots Waiting for New Xerox Systems to Arrive + New Xerox Slots Waiting for New Xerox Systems to Arrive

~ Slots  
~ |

Reassignments from Single to Multiple Industry Coverage=

Xerox Sales Reps Covering a Single Industry and Familiar with their Customers \* Actual SI to MI Fractional Reassignment Rate

~ Reps/Month  
~ |

Ratio of SI to MI Fractional Reassignment Rate after SF Reorg to that before SF Reorg\

=  
0.5  
~ Dmnl  
~ |

Fraction of New Reps Assigned to Cover Single Industries=

IF THEN ELSE(Sales Force Reorg Phase=1, Fraction of New Reps Assigned to Cover Single Industries before SF Reorg\

, Target Fraction of All Xerox Sales Reps Covering Single Industries after SF Reorg\  
)

~ Fraction  
~ |

SI to MI Fractional Reassignment Rate before SF Reorg=

0.008  
~ Fraction/Month  
~ |

Sales Force Reorg Phase=

IF THEN ELSE(Time<=Time Sales Force Reorg is Initiated, 1, IF THEN ELSE(Time<=(Time Sales Force Reorg is Initiated\

+ Duration of Sales Force Reorg), 2, 3))  
 ~ Dmnl  
 ~ Phase 1 = Before reorg; Phase 2 = During reorg; Phase 3 = After reorg.  
 |

Average Time to Make Reassignments after SF Reorg=

2  
 ~ Months  
 ~ |

Reassignments from Multiple to Single Industry Coverage=

MAX(0, IF THEN ELSE(Sales Force Reorg Phase=1, Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers\

\* MI to SI Fractional Reassignment Rate before SF Reorg, IF THEN ELSE(Sales Force Reorg Phase\

=2, MI to SI Absolute Reassignment Rate during SF Reorg, MI to SI Absolute Reassignment Rate after SF Reorg\

)) )

~ Reps/Month  
 ~ Note that the MAX function ensures that this flow is never negative - \ something required by the definition of the two connected stocks. The IF \ THEN ELSE functions pick out which reassignment rate to use depending on \ the phase of the sales force reorg.

|

Total Number of Xerox Slots=

Slots Filled with Xerox Systems + Existing Xerox Slots Waiting for New Xerox Systems to Arrive\

+ New Xerox Slots Waiting for New Xerox Systems to Arrive

~ Slots

~ |

Reassignments within Multiple Industries=

Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers \*  
Actual SI to SI and MI to MI Fractional Reassignment Rate

~ Reps/Month

~ |

Reassignments within Single Industries=

Xerox Sales Reps Covering a Single Industry and Familiar with their Customers \* Actual  
SI to SI and MI to MI Fractional Reassignment Rate

~ Reps/Month

~ |

MI to SI Fractional Reassignment Rate before SF Reorg=

0.008

~ Fraction/Month

~ |

Ratio of Average SI to SI and MI to MI Fractional Reassignment Rate during SF Reorg to that  
Not during SF Reorg\

=

2

~ Dmnl

~ |

Fraction of All Xerox Sales Reps Unfamiliar with their Customers=

IF THEN ELSE(Actual Number of All Xerox Sales Reps>0, (Xerox Sales Reps Covering  
a Single Industry and Unfamiliar with their Customers\

+ Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their  
Customers\

) / Actual Number of All Xerox Sales Reps, 0)

~ Fraction

~ |

Fraction of New Reps Assigned to Cover Single Industries before SF Reorg=

0.4

~ Fraction  
~ |

Target Fraction of All Xerox Sales Reps Covering Single Industries after SF Reorg=  
0.75

~ Fraction  
~ |

Average Time Required to Find and Hire New Xerox Sales Reps=  
4

~ Months  
~ |

Fraction of Multiple Industry Xerox Sales Reps Unfamiliar with their Customers=  
IF THEN ELSE(Actual Number of Xerox Sales Reps Covering Multiple Industries>0,  
Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers\  
/ Actual Number of Xerox Sales Reps Covering Multiple Industries, 0)

~ Fraction  
~ |

Normal SI to SI and MI to MI Fractional Reassignment Rate Not during SF Reorg=  
0.017

~ Fraction/Month  
~ |

Fraction of All Xerox Sales Reps Covering Single Industries=  
IF THEN ELSE(Actual Number of All Xerox Sales Reps>0, Actual Number of Xerox  
Sales Reps Covering Single Industries\  
/ Actual Number of All Xerox Sales Reps, 0)

~ Dmnl  
~ |

Fraction of Single Industry Xerox Sales Reps Unfamiliar with their Customers=

IF THEN ELSE(Actual Number of Xerox Sales Reps Covering Single Industries>0,  
Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers\  
/ Actual Number of Xerox Sales Reps Covering Single Industries, 0)

~ Fraction

~ |

SF Reps Leaving Xerox Path D=

Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers \*  
Actual Fractional SF Attrition Rate

~ Reps/Month

~ |

Actual Number of Xerox Sales Reps Covering Multiple Industries=

Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers + \  
Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers

~ Reps

~ |

Actual Number of Xerox Sales Reps Covering Single Industries=

Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers +  
Xerox Sales Reps Covering a Single Industry and Familiar with their Customers

~ Reps

~ |

SF Reps Leaving Xerox Path A=

Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers \*  
Actual Fractional SF Attrition Rate

~ Reps/Month

~ |

Average Time to Gain Familiarity for Reps Covering a Single Industry=

8

~ Months

~ |



Average Time to Gain Familiarity for Reps Covering Multiple Industries=

10  
~ Months  
~ |

Gaining Familiarity with Customers for Reps Covering a Single Industry=

Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers /  
Average Time to Gain Familiarity for Reps Covering a Single Industry

~ Reps/Month  
~ |

Xerox Sales Reps Covering a Single Industry and Familiar with their Customers= INTEG \

(

Gaining Familiarity with Customers for Reps Covering a Single Industry -  
(Reassignments within Single Industries\

+ Reassignments from Single to Multiple Industry Coverage + SF Reps Leaving  
Xerox Path B\

),

1513)

~ Reps

~ |

Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers= INTEG\

(

(New Reps Covering Single Industries + Reassignments within Single Industries +  
Reassignments from Multiple to Single Industry Coverage\

) - (Gaining Familiarity with Customers for Reps Covering a Single Industry + SF  
Reps Leaving Xerox Path A\

),

423.7)

~ Reps

~ |

Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers= INTEG\

(

(New Reps Covering Multiple Industries + Reassignments within Multiple Industries + \

Reassignments from Single to Multiple Industry Coverage) - (Gaining Familiarity

with Customers for Reps Covering Multiple Industries\

+ SF Reps Leaving Xerox Path C),

619.62)

~ Reps

~ |

Gaining Familiarity with Customers for Reps Covering Multiple Industries=

Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers / \

Average Time to Gain Familiarity for Reps Covering Multiple Industries

~ Reps/Month

~ |

SF Reps Leaving Xerox Path C=

Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers \* \

Actual Fractional SF Attrition Rate

~ Reps/Month

~ |

Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers= INTEG\

(

Gaining Familiarity with Customers for Reps Covering Multiple Industries -

(Reassignments within Multiple Industries\

+ Reassignments from Multiple to Single Industry Coverage + SF Reps Leaving

Xerox Path D\

),

1770)

~ Reps

~ |

**Hiring New Xerox Sales Reps=**

**MAX(0, Shortfall in Number of All Xerox Sales Reps / Average Time Required to Find and Hire New Xerox Sales Reps\**

**)**  
**~       Reps/Month**  
**~               |**

**Actual Number of All Xerox Sales Reps=**

**Xerox Sales Reps Covering a Single Industry and Unfamiliar with their Customers + Xerox Sales Reps Covering a Single Industry and Familiar with their Customers\**

**+ Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their Customers\**

**+ Xerox Sales Reps Covering Multiple Industries and Familiar with their Customers**

**~       Reps**  
**~               |**

**Shortfall in Number of All Xerox Sales Reps=**

**Desired Number of All Xerox Sales Reps - Actual Number of All Xerox Sales Reps**

**~       Reps**  
**~               |**

**New Reps Covering Multiple Industries=**

**Hiring New Xerox Sales Reps \* (1 - Fraction of New Reps Assigned to Cover Single Industries\**

**)**  
**~       Reps/Month**  
**~               |**

**New Reps Covering Single Industries=**

**Hiring New Xerox Sales Reps \* Fraction of New Reps Assigned to Cover Single Industries**

**~       Reps/Month**  
**~               |**

Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation=

IF THEN ELSE((Time>Time Sales Force Reorg is Initiated) :AND: (Time<=(Time Sales Force Reorg is Initiated\

+ Duration of Sales Force Reorg)), (Time - Time Sales Force Reorg is Initiated) /  
\  
Duration of Sales Force Reorg, 0)  
~ Dmnl  
~ |

Duration of Sales Force Reorg=

12  
~ Months  
~ |

Normal Fractional SF Attrition Rate=

0.01  
~ Fraction/Month  
~ |

Desired Number of All Xerox Sales Reps=

4500  
~ Reps  
~ |

Time Sales Force Reorg is Initiated=

12  
~ Months  
~ |

Combined Competitive Effectiveness Attractiveness and Satisfaction=

Total Effectiveness of Competitive Sales Force \* Total Attractiveness of Competitive Product Line\

\* Total Satisfaction with Other Factors of Competition

~ Dmnl

~ |

Xerox Fraction of Total Effectiveness Attractiveness and Satisfaction=

Combined Xerox Effectiveness Attractiveness and Satisfaction / Total Effectiveness Attractiveness and Satisfaction

~ Dmnl

~ |

Total Effectiveness Attractiveness and Satisfaction=

Combined Xerox Effectiveness Attractiveness and Satisfaction + Combined Competitive Effectiveness Attractiveness and Satisfaction

~ Dmnl

~ |

Deciding to Replace Competitive Slots with Competitive Systems=

(1 - Xerox Retention and Migration Fraction) \* (Slots Filled with Competitive Systems\  
/Average Life of Competitive Systems)

~ Slots/Month

~ |

Deciding to Replace Competitive Slots with Xerox Systems=

Xerox Retention and Migration Fraction \* (Slots Filled with Competitive Systems/Average Life of Competitive Systems\  
)

~ Slots/Month

~ |

Deciding to Replace Xerox Slots with Competitive Systems=

(1 - Xerox Retention and Migration Fraction) \* (Slots Filled with Xerox Systems/Average Life of Xerox Systems\  
)

~ Slots/Month

~ |

Deciding to Replace Xerox Slots with Xerox Systems=

Xerox Retention and Migration Fraction \* (Slots Filled with Xerox Systems/Average Life of Xerox Systems\

)

~ Slots/Month

~ |

Slots Filled with Competitive Systems= INTEG (

(Existing Competitive Slots being Replaced with New Competitive Systems + New Competitive Slots being Filled with New Competitive Systems\

) - (Deciding to Replace Competitive Slots with Competitive Systems + Deciding to Replace Competitive Slots with Xerox Systems\

+ Competitive Slots Disappearing Entirely),

685.54)

~ Slots

~ |

Slots Filled with Xerox Systems= INTEG (

(Existing Xerox Slots being Replaced with New Xerox Systems + New Xerox Slots being Filled with New Xerox Systems\

) - (Deciding to Replace Xerox Slots with Xerox Systems + Deciding to Replace Xerox Slots with Competitive Systems\

+ Xerox Slots Disappearing Entirely),

293.93)

~ Slots

~ |

Average Life of Competitive Systems=

48

~ Months

~ |

Average Life of Xerox Systems=

48

~ Months

~ |

New Xerox Slots Waiting for New Xerox Systems to Arrive= INTEG (

New Xerox Slots being Created and Orders being Placed+Deciding to Replace  
Competitive Slots with Xerox Systems\

-New Xerox Slots being Filled with New Xerox Systems,  
4.284)

~ Slots

~ |

New Competitive Slots Waiting for New Competitive Systems to Arrive= INTEG (

New Competitive Slots being Created and Orders being Placed+Deciding to Replace  
Xerox Slots with Competitive Systems\

-New Competitive Slots being Filled with New Competitive Systems,  
4.286)

~ Slots

~ |

Average Competitive System Delivery Time=

1

~ Month

~ |

Existing Competitive Slots Waiting for New Competitive Systems to Arrive= INTEG (

Deciding to Replace Competitive Slots with Competitive Systems-Existing Competitive  
Slots being Replaced with New Competitive Systems\

,  
9.997)

~ Slots

~ |

Competitive Slots Disappearing Entirely=

0

~ Slots/Month

~ |

Existing Competitive Slots being Replaced with New Competitive Systems=

Existing Competitive Slots Waiting for New Competitive Systems to Arrive/Average  
Competitive System Delivery Time

~ Slots/Month

~ |

Existing Xerox Slots Waiting for New Xerox Systems to Arrive= INTEG (

Deciding to Replace Xerox Slots with Xerox Systems-Existing Xerox Slots being  
Replaced with New Xerox Systems\

,  
1.837)

~ Slots

~ |

New Competitive Slots being Created and Orders being Placed=

0

~ Slots/Month

~ |

New Competitive Slots being Filled with New Competitive Systems=

New Competitive Slots Waiting for New Competitive Systems to Arrive/Average  
Competitive System Delivery Time

~ Slots/Month

~ |

Average Xerox System Delivery Time=

1



~ Month

~ |

Existing Xerox Slots being Replaced with New Xerox Systems=

Existing Xerox Slots Waiting for New Xerox Systems to Arrive/Average Xerox System  
Delivery Time

~ Slots/Month

~ |

New Xerox Slots being Created and Orders being Placed=

0

~ Slots/Month

~ |

New Xerox Slots being Filled with New Xerox Systems=

New Xerox Slots Waiting for New Xerox Systems to Arrive/Average Xerox System  
Delivery Time

~ Slots/Month

~ |

Xerox Slots Disappearing Entirely=

0

~ Slots/Month

~ |

\*\*\*\*\*

.Control

\*\*\*\*\*~

Simulation Control Parameters

|

FINAL TIME = 240

~ Month

~ The final time for the simulation.  
|

INITIAL TIME = 0

~ Month  
~ The initial time for the simulation.  
|

SAVEPER =

TIME STEP

~ Month  
~ The frequency with which output is stored.  
|

TIME STEP = 0.0078125

~ Month  
~ The time step for the simulation.  
|

\\--/// Sketch information - do not modify anything except names

V300 Do not put anything below this section - it will be ignored

\*Market Dynamics in terms of Slots

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Slots Filled with Xerox Systems,302,48,48,25,3,3,0,0,0,0,0

10,2,Existing Xerox Slots Waiting for New Xerox Systems to  
Arrive,949,49,75,29,3,3,0,0,0,0,0

10,3,New Xerox Slots Waiting for New Xerox Systems to Arrive,838,155,81,26,3,3,0,0,0,0,0

12,4,48,445,153,8,8,0,3,0,0,-1,0,0,0

1,5,7,4,4,0,0,22,0,0,0,-1--1--1,,3|(425,152)|(425,152)|(431,152)|

1,6,7,1,100,0,0,22,0,0,0,-1--1--1,,1|(302,152)|

11,7,48,362,152,6,8,34,3,0,0,1,0,0,0

10,8,Xerox Slots Disappearing Entirely,362,185,73,25,40,3,0,0,-1,0,0,0

12,9,48,559,153,8,8,0,3,0,0,-1,0,0,0

1,10,12,3,4,0,0,22,0,0,0,-1--1--1,,1|(708,153)|  
 1,11,12,9,100,0,0,22,0,0,0,-1--1--1,,1|(607,153)|  
 11,12,48,654,153,6,8,34,3,0,0,1,0,0,0  
 10,13,New Xerox Slots being Created and Orders being Placed,654,185,102,24,40,3,0,0,-1,0,0,0  
 1,14,16,1,4,0,0,22,0,0,0,-1--1--1,,4|(165,364)|(165,364)|(165,35)|(209,35)|  
 1,15,16,2,100,0,0,22,0,0,0,-1--1--1,,4|(1046,364)|(1046,363)|(1046,49)|(1035,49)|  
 11,16,4076,594,364,6,8,34,3,0,0,1,0,0,0  
 10,17,Existing Xerox Slots being Replaced with New Xerox Systems,594,400,120,28,40,3,0,0,-1,0,0,0  
 1,18,20,1,4,0,0,22,0,0,0,-1--1--1,,4|(202,287)|(202,288)|(202,59)|(228,59)|  
 1,19,20,3,100,0,0,22,0,0,0,-1--1--1,,4|(988,287)|(988,287)|(988,155)|(953,155)|  
 11,20,4028,593,287,6,8,34,3,0,0,1,0,0,0  
 10,21,New Xerox Slots being Filled with New Xerox Systems,593,319,102,24,40,3,0,0,-1,0,0,0  
 10,22,Average Xerox System Delivery Time,346,327,73,20,8,3,0,0,0,0,0,0  
 1,23,3,21,1,0,0,0,0,64,0,-1--1--1,,1|(781,259)|  
 1,24,22,21,1,0,0,0,0,64,0,-1--1--1,,1|(455,334)|  
 1,25,22,17,1,0,0,0,0,64,0,-1--1--1,,1|(434,382)|  
 1,26,2,17,1,0,0,0,0,64,0,-1--1--1,,1|(924,240)|  
 10,27,Slots Filled with Competitive Systems,301,-225,55,28,3,3,0,0,0,0,0,0  
 10,28,Existing Competitive Slots Waiting for New Competitive Systems to Arrive,944,-224,95,31,3,3,0,0,0,0,0,0  
 10,29,New Competitive Slots Waiting for New Competitive Systems to Arrive,814,-347,95,32,3,3,0,0,0,0,0,0  
 12,30,48,458,-346,8,8,0,3,0,0,-1,0,0,0  
 1,31,33,30,4,0,0,22,0,0,0,-1--1--1,,1|(417,-346)|  
 1,32,33,27,100,0,0,22,0,0,0,-1--1--1,,1|(301,-346)|  
 11,33,48,379,-346,6,8,34,3,0,0,1,0,0,0  
 10,34,Competitive Slots Disappearing Entirely,379,-319,68,19,40,3,0,0,-1,0,0,0  
 12,35,48,530,-346,8,8,0,3,0,0,-1,0,0,0  
 1,36,38,29,4,0,0,22,0,0,0,-1--1--1,,1|(676,-347)|  
 1,37,38,35,100,0,0,22,0,0,0,-1--1--1,,1|(579,-347)|  
 11,38,48,627,-347,6,8,34,3,0,0,1,0,0,0  
 10,39,New Competitive Slots being Created and Orders being Placed,627,-311,81,28,40,3,0,0,-1,0,0,0

1,40,42,27,4,0,0,22,0,0,0,-1--1--1,,4|(203,-452)|(203,-455)|(203,-239)|(224,-239)|  
 1,41,42,29,100,0,0,22,0,0,0,-1--1--1,,4|(938,-452)|(938,-452)|(938,-348)|(923,-348)|  
 11,42,4092,595,-452,6,8,34,3,0,0,1,0,0,0  
 10,43,New Competitive Slots being Filled with New Competitive Systems,595,-  
 415,102,29,40,3,0,0,-1,0,0,0  
 1,44,46,27,4,0,0,22,0,0,0,-1--1--1,,4|(164,-530)|(164,-527)|(164,-214)|(205,-214)|  
 1,45,46,28,100,0,0,22,0,0,0,-1--1--1,,4|(1051,-530)|(1051,-529)|(1051,-223)|(1045,-223)|  
 11,46,3996,592,-530,6,8,34,3,0,0,1,0,0,0  
 10,47,Existing Competitive Slots being Replaced with New Competitive Systems,592,-  
 494,90,28,40,3,0,0,-1,0,0,0  
 10,48,Average Competitive System Delivery Time,344,-495,70,19,8,3,0,0,0,0,0,0  
 1,49,48,47,1,0,0,0,0,64,0,-1--1--1,,1|(452,-512)|  
 1,50,48,43,1,0,0,0,0,64,0,-1--1--1,,1|(439,-439)|  
 1,51,29,43,1,0,0,0,0,64,0,-1--1--1,,1|(748,-418)|  
 1,52,28,47,1,0,0,0,0,64,0,-1--1--1,,1|(898,-406)|  
 1,53,54,28,4,0,0,22,0,0,0,-1--1--1,,1|(720,-224)|  
 11,54,4108,585,-224,6,8,34,3,0,0,1,0,0,0  
 10,55,Deciding to Replace Competitive Slots with Competitive Systems,585,-  
 186,77,30,40,3,0,0,-1,0,0,0  
 1,56,57,2,4,0,0,22,0,0,0,-1--1--1,,1|(733,47)|  
 11,57,3884,586,47,6,8,34,3,0,0,1,0,0,0  
 10,58,Deciding to Replace Xerox Slots with Xerox Systems,586,83,68,28,40,3,0,0,-1,0,0,0  
 1,59,60,3,4,0,0,22,0,0,0,-1--1--1,,3|(837,-139)|(837,-132)|(837,-2)|  
 11,60,3964,706,-139,6,8,34,3,0,0,1,0,0,0  
 10,61,Deciding to Replace Competitive Slots with Xerox Systems,706,-103,81,28,40,3,0,0,-  
 1,0,0,0  
 1,62,63,29,4,0,0,22,0,0,0,-1--1--1,,3|(819,-38)|(819,-38)|(819,-177)|  
 11,63,3916,704,-38,6,8,34,3,0,0,1,0,0,0  
 10,64,Deciding to Replace Xerox Slots with Competitive Systems,704,-2,75,28,40,3,0,0,-1,0,0,0  
 10,65,Average Life of Competitive Systems,407,-113,67,19,8,3,0,0,0,0,0,0  
 10,66,Average Life of Xerox Systems,405,-64,50,19,8,3,0,0,0,0,0,0  
 10,67,Xerox Retention and Migration Fraction,956,-79,80,30,8,2,0,3,-1,0,0,0,128-128-128,0-0-  
 0,12||128-128-128  
 1,68,67,58,1,0,0,0,0,64,0,-1--1--1,,1|(813,32)|

1,69,67,64,1,0,0,0,0,64,0,-1--1--1,,1|(862,-24)|  
 1,70,67,61,1,0,0,0,0,64,0,-1--1--1,,1|(862,-99)|  
 1,71,67,55,1,0,0,0,0,64,0,-1--1--1,,1|(803,-168)|  
 1,72,57,1,100,0,0,22,0,0,0,-1--1--1,,1|(465,47)|  
 1,73,63,1,100,0,0,22,0,0,0,-1--1--1,,3|(302,-38)|(302,-36)|(302,-7)|  
 1,74,66,58,1,0,0,0,0,64,0,-1--1--1,,1|(445,-3)|  
 1,75,1,58,1,0,0,0,0,64,0,-1--1--1,,1|(424,72)|  
 1,76,66,64,1,0,0,0,0,64,0,-1--1--1,,1|(527,-27)|  
 1,77,1,64,1,0,0,0,0,64,0,-1--1--1,,1|(470,14)|  
 1,78,54,27,100,0,0,22,0,0,0,-1--1--1,,1|(467,-224)|  
 1,79,60,27,100,0,0,22,0,0,0,-1--1--1,,3|(301,-139)|(301,-142)|(301,-170)|  
 1,80,27,55,1,0,0,0,0,64,0,-1--1--1,,1|(423,-202)|  
 1,81,27,61,1,0,0,0,0,64,0,-1--1--1,,1|(480,-151)|  
 1,82,65,55,1,0,0,0,0,64,0,-1--1--1,,1|(452,-160)|  
 1,83,65,61,1,0,0,0,0,64,0,-1--1--1,,1|(558,-94)|  
 10,84,Slots Filled with Competitive Systems,353,521,72,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,85,Slots Filled with Xerox Systems,359,644,56,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,86,New Competitive Slots Waiting for New Competitive Systems to Arrive,870,444,94,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,87,Existing Competitive Slots Waiting for New Competitive Systems to Arrive,994,519,94,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,88,Existing Xerox Slots Waiting for New Xerox Systems to Arrive,998,641,89,29,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,89,New Xerox Slots Waiting for New Xerox Systems to Arrive,868,724,79,29,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,90,Total Number of Xerox Slots,534,726,54,19,8,3,0,0,0,0,0,0  
 1,91,85,90,1,0,0,0,0,64,0,-1--1--1,,1|(464,672)|  
 1,92,89,90,1,0,0,0,0,64,0,-1--1--1,,1|(695,724)|  
 1,93,88,90,1,0,0,0,0,64,0,-1--1--1,,1|(755,685)|  
 10,94,Total Number of All Slots,660,592,54,19,8,3,0,0,0,0,0,0  
 1,95,84,94,1,0,0,0,0,64,0,-1--1--1,,1|(557,541)|  
 1,96,85,94,1,0,0,0,0,64,0,-1--1--1,,1|(551,635)|

1,97,86,94,1,0,0,0,0,64,0,-1--1--1,,1|(694,527)|

1,98,87,94,1,0,0,0,0,64,0,-1--1--1,,1|(777,535)|

1,99,88,94,1,0,0,0,0,64,0,-1--1--1,,1|(751,637)|

1,100,89,94,1,0,0,0,0,64,0,-1--1--1,,1|(706,666)|

10,101,Xerox Market Share,206,593,46,19,8,3,0,0,0,0,0,0

1,102,94,101,0,0,0,0,0,64,0,-1--1--1,,1|(436,592)|

1,103,90,101,1,0,0,0,0,64,0,-1--1--1,,1|(323,693)|

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\*Xerox Retention and Migration Fraction

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Xerox Retention and Migration Fraction,1093,244,70,22,8,3,0,0,0,0,0,0

10,2,Total Effectiveness of Competitive Sales Force,313,472,88,20,8,3,0,0,0,0,0,0

10,3,Total Attractiveness of Competitive Product Line,307,592,85,23,8,3,0,0,0,0,0,0

10,4,Total Satisfaction with Other Factors of Competition,314,709,98,22,8,3,0,0,0,0,0,0

10,5,Combined Xerox Effectiveness Attractiveness and  
Satisfaction,533,243,69,42,8,3,0,0,0,0,0,0

10,6,Combined Competitive Effectiveness Attractiveness and  
Satisfaction,525,592,76,41,8,3,0,0,0,0,0,0

10,7,Xerox Fraction of Total Effectiveness Attractiveness and  
Satisfaction,828,243,80,40,8,3,0,0,0,0,0,0

10,8,Total Effectiveness Attractiveness and Satisfaction,674,406,53,39,8,3,0,0,0,0,0,0

1,9,2,6,1,0,0,0,0,64,0,-1--1--1,,1|(460,504)|

1,10,3,6,1,0,0,0,0,64,0,-1--1--1,,1|(438,587)|

1,11,4,6,1,0,0,0,0,64,0,-1--1--1,,1|(455,674)|

1,12,5,8,1,0,0,0,0,64,0,-1--1--1,,1|(642,308)|

1,13,5,7,1,0,0,0,0,64,0,-1--1--1,,1|(668,243)|

1,14,6,8,1,0,0,0,0,64,0,-1--1--1,,1|(647,492)|

1,15,8,7,1,0,0,0,0,64,0,-1--1--1,,1|(808,309)|

10,16,Total Effectiveness of Xerox Sales Force,316,121,82,21,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,17,Time,864,428,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,18,Time Customer Admin Center Reorg is Initiated,868,512,82,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,19,Time Sales Force Reorg is Initiated,870,609,61,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,20,Snapshot of Xerox Retention and Migration Fraction at Start of First Reorg,1093,430,107,32,8,3,0,0,0,0,0

1,21,1,20,0,0,0,0,0,64,0,-1--1--1,,1|(1093,325)|

1,22,17,20,0,0,0,0,0,64,0,-1--1--1,,1|(931,428)|

1,23,18,20,1,0,0,0,0,64,0,-1--1--1,,1|(996,501)|

1,24,19,20,1,0,0,0,0,64,0,-1--1--1,,1|(1027,552)|

10,25,Total Attractiveness of Xerox Product Line,315,241,84,23,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,26,Total Satisfaction with Other Factors of Xerox,316,349,80,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,27,16,5,1,0,0,0,0,64,0,-1--1--1,,1|(443,143)|

1,28,25,5,0,0,0,0,0,64,0,-1--1--1,,1|(424,241)|

1,29,26,5,1,0,0,0,0,64,0,-1--1--1,,1|(443,336)|

1,30,7,1,0,0,0,0,0,64,0,-1--1--1,,1|(958,243)|

10,31,Initial Xerox Retention and Migration Fraction,85,592,73,19,8,3,0,0,-1,0,0,0

1,32,31,2,1,0,0,0,0,64,0,-1--1--1,,1|(152,513)|

1,33,31,3,0,0,0,0,0,64,0,-1--1--1,,1|(183,592)|

1,34,31,4,1,0,0,0,0,64,0,-1--1--1,,1|(148,670)|

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\*Sales Force Effectiveness

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Fraction of All Xerox Sales Reps Covering Single Industries,117,309,114,25,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,2,Fraction of All Xerox Sales Reps Unfamiliar with their Customers,120,77,115,21,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,3,Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of SF Reorg,108,397,101,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,4,Snapshot of Fraction of All Xerox Sales Reps Unfamiliar with their Customers at Start of First Reorg,117,163,112,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,5,Ratio of Xerox Sales Rep Single Industry Coverage Current vs at Start of SF Reorg,419,354,107,30,8,3,0,0,0,0,0

10,6,Ratio of Xerox Sales Rep Unfamiliarity with Customers Current vs at Start of First Reorg,409,119,111,33,8,3,0,0,0,0,0

1,7,3,5,1,0,0,0,0,64,0,-1--1--1,,1|(306,406)|  
 1,8,1,5,1,0,0,0,0,64,0,-1--1--1,,1|(273,293)|  
 1,9,4,6,1,0,0,0,0,64,0,-1--1--1,,1|(286,168)|  
 1,10,2,6,1,0,0,0,0,64,0,-1--1--1,,1|(259,69)|  
 10,11,Lookup Table for Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness,414,217,135,33,8,3,0,0,0,0,0  
 10,12,Effect of Ratio of Unfamiliarity with Customers on Xerox Sales Force Effectiveness,660,164,100,29,8,3,0,0,0,0,0  
 1,13,6,12,1,0,0,0,0,64,0,-1--1--1,,1|(543,109)|  
 1,14,11,12,1,0,0,0,0,64,0,-1--1--1,,1|(586,207)|  
 10,15,Total Effectiveness of Xerox Sales Force,940,409,68,19,8,3,0,0,0,0,0  
 1,16,12,15,1,0,0,0,0,64,0,-1--1--1,,1|(861,267)|  
 10,17,Actual Fraction of Time Selling,115,577,68,23,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,18,Snapshot of Actual Fraction of Time Selling at Start of First Reorg,119,648,117,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,19,Ratio of Actual Fraction of Time Selling Current vs at Start of First Reorg,418,612,92,28,8,3,0,0,0,0,0  
 1,20,17,19,1,0,0,0,0,64,0,-1--1--1,,1|(272,576)|  
 1,21,18,19,1,0,0,0,0,64,0,-1--1--1,,1|(288,656)|  
 10,22,Lookup Table for Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness,423,717,107,28,8,3,0,0,0,0,0  
 10,23,Effect of Ratio of Fraction of Time Selling on Xerox Sales Force Effectiveness,662,665,93,28,8,3,0,0,0,0,0  
 1,24,19,23,1,0,0,0,0,64,0,-1--1--1,,1|(543,616)|  
 1,25,22,23,1,0,0,0,0,64,0,-1--1--1,,1|(555,713)|  
 1,26,23,15,1,0,0,0,0,64,0,-1--1--1,,1|(852,570)|  
 10,27,Lookup Table for Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness,421,466,120,32,8,3,0,0,0,0,0  
 10,28,Effect of Ratio of Single Industry Coverage on Xerox Sales Force Effectiveness,667,407,111,28,8,3,0,0,0,0,0  
 1,29,27,28,1,0,0,0,0,64,0,-1--1--1,,1|(559,458)|  
 1,30,5,28,1,0,0,0,0,64,0,-1--1--1,,1|(552,355)|  
 1,31,28,15,1,0,0,0,0,64,0,-1--1--1,,1|(818,407)|

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**\*Sales Force Industry Coverage Reorg**

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96  
10,1,Desired Number of All Xerox Sales Reps,80,420,74,18,8,3,0,0,0,0,0  
10,2,Shortfall in Number of All Xerox Sales Reps,87,506,71,19,8,3,0,0,0,0,0  
1,3,1,2,1,0,0,0,0,64,0,-1--1--1,,1|(62,457)|  
10,4,Average Time Required to Find and Hire New Xerox Sales  
Reps,81,668,78,28,8,3,0,0,0,0,0  
10,5,Duration of Sales Force Reorg,278,184,62,22,8,3,0,0,0,0,0  
10,6,Time Sales Force Reorg is Initiated,276,106,61,20,8,3,0,0,0,0,0  
10,7,Time,277,55,32,10,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,8,Fraction of SF Reorg Duration Elapsed since SF Reorg  
Initiation,83,107,79,30,8,3,0,0,0,0,0  
1,9,5,8,1,0,0,0,0,64,0,-1--1--1,,1|(171,163)|  
1,10,6,8,1,0,0,0,0,64,0,-1--1--1,,1|(195,106)|  
1,11,7,8,1,0,0,0,0,64,0,-1--1--1,,1|(189,58)|  
10,12,Xerox Sales Reps Covering a Single Industry and Unfamiliar with their  
Customers,494,391,81,41,3,3,0,0,0,0,0  
10,13,Xerox Sales Reps Covering a Single Industry and Familiar with their  
Customers,968,388,73,42,3,3,0,0,0,0,0  
10,14,Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their  
Customers,493,751,87,38,3,3,0,0,0,0,0  
10,15,Xerox Sales Reps Covering Multiple Industries and Familiar with their  
Customers,970,753,80,43,3,3,0,0,0,0,0  
12,16,48,124,561,8,8,0,3,0,0,-1,0,0,0  
12,17,48,274,562,8,8,0,3,0,0,-1,0,0,0  
1,18,20,17,4,0,0,22,0,0,0,-1--1--1,,1|(232,561)|  
1,19,20,16,100,0,0,22,0,0,0,-1--1--1,,1|(159,561)|  
11,20,48,192,561,6,8,34,3,0,0,1,0,0,0  
10,21,Hiring New Xerox Sales Reps,192,588,59,19,40,3,0,0,-1,0,0,0  
12,22,48,258,390,8,8,0,3,0,0,-1,0,0,0  
1,23,25,12,4,0,0,22,0,0,0,-1--1--1,,1|(376,390)|  
1,24,25,22,100,0,0,22,0,0,0,-1--1--1,,1|(296,390)|  
11,25,48,333,390,6,8,34,3,0,0,1,0,0,0

10,26,New Reps Covering Single Industries,333,423,65,25,40,3,0,0,-1,0,0,0  
 12,27,48,258,751,8,8,0,3,0,0,-1,0,0,0  
 1,28,30,14,4,0,0,22,0,0,0,-1--1--1,,1|(371,750)|  
 1,29,30,27,100,0,0,22,0,0,0,-1--1--1,,1|(295,750)|  
 11,30,48,330,750,6,8,34,3,0,0,1,0,0,0  
 10,31,New Reps Covering Multiple Industries,330,781,68,23,40,3,0,0,-1,0,0,0  
 10,32,Xerox Sales Reps Covering a Single Industry and Unfamiliar with their  
 Customers,389,1302,106,29,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,33,Xerox Sales Reps Covering a Single Industry and Familiar with their  
 Customers,864,1303,110,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,34,Xerox Sales Reps Covering Multiple Industries and Unfamiliar with their  
 Customers,394,1473,116,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,35,Xerox Sales Reps Covering Multiple Industries and Familiar with their  
 Customers,867,1470,109,29,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,36,Actual Number of All Xerox Sales Reps,624,1383,80,21,8,3,0,0,0,0,0,0  
 1,37,32,36,1,0,0,0,0,64,0,-1--1--1,,1|(562,1320)|  
 1,38,33,36,1,0,0,0,0,64,0,-1--1--1,,1|(695,1317)|  
 1,39,35,36,1,0,0,0,0,64,0,-1--1--1,,1|(702,1457)|  
 1,40,34,36,1,0,0,0,0,64,0,-1--1--1,,1|(580,1444)|  
 10,41,Actual Number of All Xerox Sales Reps,141,375,93,22,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 1,42,41,2,1,0,0,0,0,64,0,-1--1--1,,1|(174,443)|  
 1,43,2,21,1,0,0,0,0,64,0,-1--1--1,,1|(95,562)|  
 1,44,4,21,1,0,0,0,0,64,0,-1--1--1,,1|(173,631)|  
 10,45,Fraction of New Reps Assigned to Cover Single Industries,345,640,105,22,8,3,0,0,0,0,0,0  
 1,46,21,26,1,0,0,0,0,64,0,-1--1--1,,1|(240,498)|  
 1,47,21,31,1,0,0,0,0,64,0,-1--1--1,,1|(215,682)|  
 1,48,45,31,1,0,0,0,0,64,0,-1--1--1,,1|(312,689)|  
 1,49,45,26,1,0,0,0,0,64,0,-1--1--1,,1|(375,523)|  
 12,50,48,463,215,8,8,0,3,0,0,-1,0,0,0  
 1,51,53,50,4,0,0,22,0,0,0,-1--1--1,,1|(463,247)|  
 1,52,53,12,100,0,0,22,0,0,0,-1--1--1,,1|(463,316)|  
 11,53,48,463,277,8,6,33,3,0,0,2,0,0,0  
 10,54,SF Reps Leaving Xerox Path A,398,277,57,19,40,3,0,0,-1,0,0,0

12,55,48,1180,387,8,8,0,3,0,0,-1,0,0,0  
 1,56,58,55,4,0,0,22,0,0,0,-1--1--1,,1|(1142,387)|  
 1,57,58,13,100,0,0,22,0,0,0,-1--1--1,,1|(1070,387)|  
 11,58,48,1106,387,6,8,34,3,0,0,1,0,0,0  
 10,59,SF Reps Leaving Xerox Path B,1106,414,58,19,40,3,0,0,-1,0,0,0  
 12,60,48,457,907,8,8,0,3,0,0,-1,0,0,0  
 1,61,63,60,4,0,0,22,0,0,0,-1--1--1,,1|(457,874)|  
 1,62,63,14,100,0,0,22,0,0,0,-1--1--1,,1|(457,813)|  
 11,63,48,457,844,8,6,33,3,0,0,2,0,0,0  
 10,64,SF Reps Leaving Xerox Path C,388,844,61,21,40,3,0,0,-1,0,0,0  
 12,65,48,1185,752,8,8,0,3,0,0,-1,0,0,0  
 1,66,68,65,4,0,0,22,0,0,0,-1--1--1,,1|(1146,752)|  
 1,67,68,15,100,0,0,22,0,0,0,-1--1--1,,1|(1077,752)|  
 11,68,48,1110,752,6,8,34,3,0,0,1,0,0,0  
 10,69,SF Reps Leaving Xerox Path D,1110,779,56,19,40,3,0,0,-1,0,0,0  
 1,70,72,13,4,0,0,22,0,0,0,-1--1--1,,1|(818,386)|  
 1,71,72,12,100,0,0,22,0,0,0,-1--1--1,,1|(652,386)|  
 11,72,3676,735,386,6,8,34,3,0,0,3,0,0,0  
 10,73,Gaining Familiarity with Customers for Reps Covering a Single Industry,735,350,99,28,40,3,0,0,-1,0,0,0  
 1,74,76,15,4,0,0,22,0,0,0,-1--1--1,,1|(815,750)|  
 1,75,76,14,100,0,0,22,0,0,0,-1--1--1,,1|(654,750)|  
 11,76,3740,735,750,6,8,34,3,0,0,1,0,0,0  
 10,77,Gaining Familiarity with Customers for Reps Covering Multiple Industries,735,785,102,27,40,3,0,0,-1,0,0,0  
 1,78,80,12,4,0,0,22,0,0,0,-1--1--1,,3|(522,244)|(522,244)|(522,297)|  
 1,79,80,13,100,0,0,22,0,0,0,-1--1--1,,3|(969,244)|(969,244)|(969,295)|  
 11,80,3788,736,244,6,8,34,3,0,0,3,0,0,0  
 10,81,Reassignments within Single Industries,736,214,74,22,40,3,0,0,-1,0,0,0  
 10,82,Actual Fractional SF Attrition Rate,266,317,59,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,83,Actual Fractional SF Attrition Rate,291,915,59,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,84,Actual Fractional SF Attrition Rate,1058,861,59,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,85,82,54,1,0,0,0,0,64,0,-1--1--1,,1|(356,320)|

1,86,12,54,1,0,0,0,0,64,0,-1--1--1,,1|(419,319)|

1,87,13,59,1,0,0,0,0,64,0,-1--1--1,,1|(1072,442)|

1,88,84,69,1,0,0,0,0,64,0,-1--1--1,,1|(1114,827)|

1,89,15,69,1,0,0,0,0,64,0,-1--1--1,,1|(1060,812)|

1,90,14,64,1,0,0,0,0,64,0,-1--1--1,,1|(403,800)|

1,91,83,64,1,0,0,0,0,64,0,-1--1--1,,1|(388,892)|

1,92,94,14,4,0,0,22,0,0,0,-1--1--1,,3|(521,888)|(521,888)|(521,838)|

1,93,94,15,100,0,0,22,0,0,0,-1--1--1,,3|(970,888)|(970,888)|(970,842)|

11,94,1868,744,888,6,8,34,3,0,0,1,0,0,0

10,95,Reassignments within Multiple Industries,744,915,83,19,40,3,0,0,-1,0,0,0

10,96,Average Time to Gain Familiarity for Reps Covering a Single Industry,617,280,87,32,8,3,0,0,0,0,0

10,97,Average Time to Gain Familiarity for Reps Covering Multiple Industries,627,851,102,30,8,3,0,0,0,0,0

1,98,12,73,1,0,0,0,0,64,0,-1--1--1,,1|(601,349)|

1,99,96,73,1,0,0,0,0,64,0,-1--1--1,,1|(724,294)|

1,100,14,77,1,0,0,0,0,64,0,-1--1--1,,1|(640,791)|

1,101,97,77,1,0,0,0,0,64,0,-1--1--1,,1|(733,835)|

1,102,104,14,4,0,0,22,0,0,0,-1--1--1,,3|(457,498)|(457,497)|(457,605)|

1,103,104,13,100,0,0,22,0,0,0,-1--1--1,,3|(967,498)|(967,497)|(967,463)|

11,104,3724,736,498,6,8,34,3,0,0,3,0,0,0

10,105,Reassignments from Single to Multiple Industry Coverage,736,467,98,23,40,3,0,0,-1,0,0,0

1,106,108,12,4,0,0,22,0,0,0,-1--1--1,,3|(498,631)|(498,630)|(498,531)|

1,107,108,15,100,0,0,22,0,0,0,-1--1--1,,3|(970,631)|(970,630)|(970,670)|

11,108,2892,732,631,6,8,34,3,0,0,1,0,0,0

10,109,Reassignments from Multiple to Single Industry Coverage,732,662,108,23,40,3,0,0,-1,0,0,0

10,110,Actual Number of Xerox Sales Reps Covering Single Industries,624,1269,100,26,8,3,0,0,0,0,0

10,111,Actual Number of Xerox Sales Reps Covering Multiple Industries,626,1522,115,26,8,3,0,0,0,0,0

1,112,32,110,1,0,0,0,0,64,0,-1--1--1,,1|(498,1268)|  
 1,113,33,110,1,0,0,0,0,64,0,-1--1--1,,1|(748,1270)|  
 1,114,34,111,1,0,0,0,0,64,0,-1--1--1,,1|(469,1507)|  
 1,115,35,111,1,0,0,0,0,64,0,-1--1--1,,1|(778,1518)|  
 10,116,Normal SI to SI and MI to MI Fractional Reassignment Rate Not during SF  
 Reorg,1070,75,103,28,8,3,0,0,0,0,0  
 1,117,13,81,1,0,0,0,0,64,0,-1--1--1,,1|(890,287)|  
 1,118,15,95,1,0,0,0,0,64,0,-1--1--1,,1|(886,878)|  
 10,119,Fraction of All Xerox Sales Reps Covering Single  
 Industries,956,1383,76,28,8,3,0,0,0,0,0  
 1,120,110,119,1,0,0,0,0,64,0,-1--1--1,,1|(729,1327)|  
 1,121,36,119,1,0,0,0,0,64,0,-1--1--1,,1|(785,1383)|  
 10,122,Fraction of Single Industry Xerox Sales Reps Unfamiliar with their  
 Customers,99,1303,99,28,8,3,0,0,0,0,0  
 10,123,Fraction of Multiple Industry Xerox Sales Reps Unfamiliar with their  
 Customers,96,1474,100,28,8,3,0,0,0,0,0  
 1,124,32,122,1,0,0,0,0,64,0,-1--1--1,,1|(247,1302)|  
 1,125,110,122,1,0,0,0,0,64,0,-1--1--1,,1|(319,1257)|  
 1,126,34,123,1,0,0,0,0,64,0,-1--1--1,,1|(244,1473)|  
 1,127,111,123,1,0,0,0,0,64,0,-1--1--1,,1|(329,1523)|  
 10,128,Target Fraction of All Xerox Sales Reps Covering Single Industries after SF  
 Reorg,382,1175,91,27,8,3,0,0,0,0,0  
 1,129,128,45,1,0,0,0,0,64,0,-1--1--1,,1|(201,875)|  
 10,130,Fraction of New Reps Assigned to Cover Single Industries before SF  
 Reorg,74,780,72,54,8,3,0,0,0,0,0  
 1,131,130,45,1,0,0,0,0,64,0,-1--1--1,,1|(181,694)|  
 10,132,Fraction of All Xerox Sales Reps Unfamiliar with their  
 Customers,232,1383,93,29,8,3,0,0,0,0,0  
 1,133,36,132,1,0,0,0,0,64,0,-1--1--1,,1|(441,1383)|  
 1,134,32,132,1,0,0,0,0,64,0,-1--1--1,,1|(263,1323)|  
 1,135,34,132,1,0,0,0,0,64,0,-1--1--1,,1|(265,1447)|  
 10,136,Ratio of Average SI to SI and MI to MI Fractional Reassignment Rate during SF Reorg  
 to that Not during SF Reorg,1073,170,131,33,8,3,0,0,0,0,0  
 10,137,MI to SI Fractional Reassignment Rate before SF Reorg,531,672,67,33,8,3,0,0,0,0,0  
 10,138,Actual SI to SI and MI to MI Fractional Reassignment Rate,798,107,70,28,8,3,0,0,0,0,0

1,139,116,138,1,0,0,0,0,64,0,-1--1--1,,1|(916,63)|  
 1,140,136,138,1,0,0,0,0,64,0,-1--1--1,,1|(857,143)|  
 1,141,138,81,1,0,0,0,0,64,0,-1--1--1,,1|(737,159)|  
 10,142,Actual SI to SI and MI to MI Fractional Reassignment Rate,556,979,76,31,8,2,0,3,-  
 1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 1,143,142,95,1,0,0,0,0,64,0,-1--1--1,,1|(617,929)|  
 10,144,Target Number of All Xerox Sales Reps to Reassign from MI to SI Coverage over  
 Duration of SF Reorg,1207,1060,97,41,8,3,0,0,0,0,0  
 10,145,MI to SI Absolute Reassignment Rate during SF Reorg,1242,585,64,33,8,3,0,0,0,0,0  
 1,146,145,109,1,0,0,0,0,64,0,-1--1--1,,1|(995,604)|  
 1,147,137,109,1,0,0,0,0,64,0,-1--1--1,,1|(663,705)|  
 10,148,Average Time to Make Reassignments after SF Reorg,1020,963,70,34,8,3,0,0,0,0,0  
 10,149,MI to SI Absolute Reassignment Rate after SF Reorg,1210,702,68,30,8,3,0,0,0,0,0  
 1,150,15,109,1,0,0,0,0,64,0,-1--1--1,,1|(818,720)|  
 1,151,149,109,1,0,0,0,0,64,0,-1--1--1,,1|(997,684)|  
 10,152,Sales Force Reorg Phase,425,107,43,20,8,3,0,0,0,0,0  
 1,153,7,152,1,0,0,0,0,64,0,-1--1--1,,1|(364,68)|  
 1,154,6,152,1,0,0,0,0,64,0,-1--1--1,,1|(352,106)|  
 1,155,5,152,1,0,0,0,0,64,0,-1--1--1,,1|(386,162)|  
 10,156,Sales Force Reorg Phase,559,602,46,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-  
 128  
 1,157,152,138,1,0,0,0,0,64,0,-1--1--1,,1|(591,107)|  
 1,158,156,109,1,0,0,0,0,64,0,-1--1--1,,1|(605,644)|  
 10,159,SI to MI Fractional Reassignment Rate before SF Reorg,573,537,65,33,8,3,0,0,0,0,0  
 1,160,13,105,1,0,0,0,0,64,0,-1--1--1,,1|(880,456)|  
 10,161,Ratio of SI to MI Fractional Reassignment Rate after SF Reorg to that before SF  
 Reorg,1069,481,101,35,8,3,0,0,0,0,0  
 10,162,Actual SI to MI Fractional Reassignment Rate,815,561,64,32,8,3,0,0,0,0,0  
 1,163,159,162,1,0,0,0,0,64,0,-1--1--1,,1|(701,539)|  
 1,164,161,162,1,0,0,0,0,64,0,-1--1--1,,1|(924,539)|  
 1,165,162,105,1,0,0,0,0,64,0,-1--1--1,,1|(812,511)|  
 1,166,156,162,1,0,0,0,0,64,0,-1--1--1,,1|(673,603)|  
 10,167,Sales Force Reorg Phase,145,921,46,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-  
 128

1,168,167,45,1,0,0,0,0,64,0,-1--1--1,,1|(169,780)|

10,169,Fraction of SF Reorg Duration Elapsed since SF Reorg  
Initiation,1042,560,78,33,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,170,169,162,1,0,0,0,0,64,0,-1--1--1,,1|(928,560)|

10,171,Time,1253,1267,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,172,Time Sales Force Reorg is Initiated,1176,1371,61,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,173,Snapshot of Fraction of All Xerox Sales Reps Covering SIs at Start of SF  
Reorg,1173,1175,92,31,8,3,0,0,0,0,0,0

10,174,Target Fraction of All Xerox Sales Reps to Reassign from MI to SI Coverage over  
Duration of SF Reorg,876,1175,122,32,8,3,0,0,0,0,0,0

1,175,128,174,0,0,0,0,0,64,0,-1--1--1,,1|(606,1175)|

1,176,173,174,1,0,0,0,0,64,0,-1--1--1,,1|(1046,1175)|

1,177,171,173,1,0,0,0,0,64,0,-1--1--1,,1|(1250,1229)|

1,178,172,173,1,0,0,0,0,64,0,-1--1--1,,1|(1146,1275)|

1,179,119,173,1,0,0,0,0,64,0,-1--1--1,,1|(1008,1262)|

1,180,174,144,1,0,0,0,0,64,0,-1--1--1,,1|(1019,1097)|

10,181,Snapshot of Actual Number of All Xerox Sales Reps at Start of SF  
Reorg,1201,1470,94,32,8,3,0,0,0,0,0,0

1,182,171,181,1,0,0,0,0,64,0,-1--1--1,,1|(1255,1322)|

1,183,172,181,1,0,0,0,0,64,0,-1--1--1,,1|(1161,1405)|

1,184,36,181,1,0,0,0,0,64,0,-1--1--1,,1|(898,1423)|

1,185,181,144,1,0,0,0,0,64,0,-1--1--1,,1|(1295,1282)|

10,186,Lookup Table for Profile of SF Reorg,584,71,66,21,8,3,0,0,0,0,0,0

10,187,Lookup Table for Profile of SF Reorg,1236,469,70,22,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,188,187,145,1,0,0,0,0,64,0,-1--1--1,,1|(1260,520)|

1,189,144,145,1,0,0,0,0,64,0,-1--1--1,,1|(1302,824)|

1,190,169,145,1,0,0,0,0,64,0,-1--1--1,,1|(1148,556)|

10,191,Duration of Sales Force Reorg,1208,952,60,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,192,191,145,1,0,0,0,0,64,0,-1--1--1,,1|(1277,784)|

10,193,Target Number of All Xerox Sales Reps Covering Single Industries after SF  
Reorg,585,1071,97,28,8,3,0,0,0,0,0,0

1,194,128,193,1,0,0,0,0,64,0,-1--1--1,,1|(436,1112)|

10,195,Shortfall in Number of Xerox Sales Reps Covering Single Industries,891,1072,85,28,8,3,0,0,0,0,0

1,196,110,195,1,0,0,0,0,64,0,-1--1--1,,1|(693,1151)|

1,197,193,195,0,0,0,0,0,64,0,-1--1--1,,1|(737,1071)|

10,198,Actual Number of All Xerox Sales Reps,352,1071,73,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,199,198,193,0,0,0,0,0,64,0,-1--1--1,,1|(449,1071)|

1,200,195,149,1,0,0,0,0,64,0,-1--1--1,,1|(1144,924)|

1,201,148,149,1,0,0,0,0,64,0,-1--1--1,,1|(1158,858)|

1,202,186,138,1,0,0,0,0,64,0,-1--1--1,,1|(699,78)|

1,203,8,138,1,0,0,0,0,64,0,-1--1--1,,1|(424,160)|

10,204,Snapshot of Fraction of All Xerox Sales Reps Unfamiliar with their Customers at Start of First Reorg,926,1549,115,30,8,3,0,0,0,0,0

1,205,132,204,1,0,0,0,0,64,0,-1--1--1,,1|(561,1461)|

1,206,171,204,1,0,0,0,0,64,0,-1--1--1,,1|(1085,1370)|

1,207,172,204,1,0,0,0,0,64,0,-1--1--1,,1|(1061,1437)|

10,208,Time Customer Admin Center Reorg is Initiated,1151,1533,60,30,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,209,208,204,1,0,0,0,0,64,0,-1--1--1,,1|(1044,1529)|

10,210,Reassignments within Single Industries,501,1589,72,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,211,Reassignments from Single to Multiple Industry Coverage,501,1639,98,25,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,212,Reassignments within Multiple Industries,502,1749,72,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,213,Reassignments from Multiple to Single Industry Coverage,504,1698,103,23,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,214,Total Absolute Reassignment Rate,867,1662,68,23,8,3,0,0,0,0,0

1,215,210,214,0,0,0,0,0,64,0,-1--1--1,,1|(679,1624)|

1,216,211,214,0,0,0,0,0,64,0,-1--1--1,,1|(692,1650)|

1,217,212,214,0,0,0,0,0,64,0,-1--1--1,,1|(679,1706)|

1,218,213,214,0,0,0,0,0,64,0,-1--1--1,,1|(695,1678)|

10,219,Snapshot of Total Absolute Reassignment Rate at Start of First Reorg,1115,1663,89,33,8,3,0,0,0,0,0

1,220,171,219,1,0,0,0,0,64,0,-1--1--1,,1|(1290,1490)|



1,221,172,219,1,0,0,0,0,64,0,-1--1--1,,1|(1067,1495)|  
 1,222,208,219,1,0,0,0,0,64,0,-1--1--1,,1|(1162,1587)|  
 1,223,214,219,0,0,0,0,0,64,0,-1--1--1,,1|(973,1662)|  
 10,224,Actual Fractional SF Attrition Rate,1232,330,59,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 1,225,224,59,1,0,0,0,0,64,0,-1--1--1,,1|(1220,372)|  
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 \*Sales Force Attrition Rate  
 \$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96  
 10,1,Lookup Table for Effects on SF Attrition Rate,638,236,87,21,8,3,0,0,-1,0,0,0  
 10,2,Effect of Internally Perceived State of the World Outside Xerox on SF Attrition Rate,842,312,100,32,8,3,0,0,-1,0,0,0  
 10,3,Effect of Internally Perceived State of Xerox on SF Attrition Rate,432,316,112,26,8,3,0,0,-1,0,0,0  
 10,4,Actual Fractional SF Attrition Rate,888,634,65,20,8,3,0,0,-1,0,0,0  
 10,5,Normal Fractional SF Attrition Rate,706,611,63,21,8,3,0,0,-1,0,0,0  
 10,6,Internally Perceived State of the World Outside Xerox,842,170,99,29,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,7,Internally Perceived State of Xerox,433,171,68,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,8,Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate,752,498,96,37,3,3,0,0,0,0,0,0  
 1,9,6,2,0,0,0,0,0,64,0,-1--1--1,,1|(842,232)|  
 1,10,1,2,1,0,0,0,0,64,0,-1--1--1,,1|(747,246)|  
 1,11,7,3,0,0,0,0,0,64,0,-1--1--1,,1|(432,233)|  
 1,12,1,3,1,0,0,0,0,64,0,-1--1--1,,1|(527,238)|  
 1,13,8,4,1,0,0,0,0,64,0,-1--1--1,,1|(859,563)|  
 1,14,5,4,1,0,0,0,0,64,0,-1--1--1,,1|(787,637)|  
 10,15,Implied Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate,634,407,100,28,8,3,0,0,0,0,0,0  
 12,16,48,423,497,8,8,0,3,0,0,-1,0,0,0  
 1,17,19,8,4,0,0,22,0,0,0,-1--1--1,,1|(599,497)|  
 1,18,19,16,100,0,0,22,0,0,0,-1--1--1,,1|(481,497)|  
 11,19,48,537,497,6,8,34,3,0,0,1,0,0,0

10,20,Change in Actual Cumulative Effect of State of Xerox and Outside World on SF Attrition Rate,537,534,112,29,40,3,0,0,-1,0,0,0

10,21,Delay in Raising SF Attrition Rate,408,612,62,22,8,3,0,0,0,0,0

10,22,Delay in Lowering SF Attrition Rate,558,638,74,19,8,3,0,0,0,0,0

1,23,21,20,1,0,0,0,0,64,0,-1--1--1,,1|(503,594)|

1,24,22,20,1,0,0,0,0,64,0,-1--1--1,,1|(561,587)|

1,25,15,20,1,0,0,0,0,64,0,-1--1--1,,1|(615,467)|

1,26,8,20,1,0,0,0,0,64,0,-1--1--1,,1|(681,576)|

1,27,2,15,1,0,0,0,0,64,0,-1--1--1,,1|(772,390)|

1,28,3,15,1,0,0,0,0,64,0,-1--1--1,,1|(489,382)|

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\*State of Xerox & the World Outside Xerox

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Xerox Retention and Migration Fraction,119,177,71,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,2,Snapshot of Xerox Retention and Migration Fraction at Start of First Reorg,119,294,98,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,3,Xerox Retention and Migration Fraction Ratio,297,227,83,20,8,3,0,0,0,0,0

10,4,Perceived Xerox Retention and Migration Fraction Ratio,723,192,82,33,3,3,0,0,0,0,0

12,5,48,440,192,8,8,0,3,0,0,-1,0,0,0

1,6,8,4,4,0,0,22,0,0,0,-1--1--1,,1|(592,193)|

1,7,8,5,100,0,0,22,0,0,0,-1--1--1,,1|(490,193)|

11,8,48,538,193,6,8,34,3,0,0,1,0,0,0

10,9,Change in Perceived Xerox Retention and Migration Fraction Ratio,538,229,87,28,40,3,0,0,-1,0,0,0

1,10,1,3,1,0,0,0,0,64,0,-1--1--1,,1|(207,175)|

1,11,2,3,1,0,0,0,0,64,0,-1--1--1,,1|(224,275)|

1,12,3,9,0,0,0,0,0,64,0,-1--1--1,,1|(408,227)|

1,13,4,9,1,0,0,0,0,64,0,-1--1--1,,1|(652,273)|

10,14,Perception Delay for Xerox Retention and Migration Fraction,348,296,72,32,8,3,0,0,0,0,0

1,15,14,9,1,0,0,0,0,64,0,-1--1--1,,1|(470,291)|

10,16,Lookup Table for Effect of Perceived Xerox Retention and Migration Fraction Ratio on Internally Perceived State of Xerox,853,300,145,35,8,3,0,0,0,0,0

10,17,Internally Perceived State of Xerox,1217,345,70,21,8,3,0,0,0,0,0

10,18,Snapshot of Total Absolute Reassignment Rate at Start of First Reorg,106,569,94,28,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,19,Total Absolute Reassignment Rate,108,469,65,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,20,Total Absolute Reassignment Rate Ratio,277,517,82,25,8,3,0,0,0,0,0

10,21,Perceived Total Absolute Reassignment Rate Ratio,725,483,85,28,3,3,0,0,0,0,0

12,22,48,433,481,8,8,0,3,0,0,-1,0,0,0

1,23,25,21,4,0,0,22,0,0,0,-1--1--1,,1|(590,481)|

1,24,25,22,100,0,0,22,0,0,0,-1--1--1,,1|(484,481)|

11,25,48,534,481,6,8,34,3,0,0,1,0,0,0

10,26,Change in Perceived Total Absolute Reassignment Rate Ratio,534,519,86,30,40,3,0,0,-1,0,0,0

10,27,Perception Delay for Total Absolute Reassignment Rate Ratio,354,583,109,24,8,3,0,0,0,0,0

10,28,Initial Total Absolute Reassignment Rate,404,438,66,19,8,3,0,0,0,0,0

1,29,19,20,1,0,0,0,0,64,0,-1--1--1,,1|(202,471)|

1,30,18,20,1,0,0,0,0,64,0,-1--1--1,,1|(227,552)|

1,31,27,26,1,0,0,0,0,64,0,-1--1--1,,1|(482,569)|

1,32,21,26,1,0,0,0,0,64,0,-1--1--1,,1|(637,568)|

1,33,20,26,0,0,0,0,0,64,0,-1--1--1,,1|(396,517)|

1,34,20,28,1,0,0,0,0,64,1,-1--1--1,,1|(310,468)|

1,35,28,21,1,0,0,0,0,64,1,-1--1--1,,1|(549,442)|

10,36,Time,997,687,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,37,Lookup Table for Perceived State of the World Outside Xerox,996,751,112,25,8,3,0,0,0,0,0

10,38,Internally Perceived State of the World Outside Xerox,1213,720,91,20,8,3,0,0,0,0,0

1,39,37,38,1,0,0,0,0,64,0,-1--1--1,,1|(1130,751)|

10,40,Lookup Table for Effect of Perceived Total Absolute Reassignment Rate Ratio on Internally Perceived State of Xerox,845,590,128,36,8,3,0,0,0,0,0

10,41,Internally Perceived State of Xerox due to Perceived Xerox Retention and Migration Fraction,1002,195,117,30,8,3,0,0,0,0,0

10,42,Internally Perceived State of Xerox due to Perceived Total Absolute Reassignment Rate,998,484,99,29,8,3,0,0,0,0,0

1,43,4,41,0,0,0,0,0,64,0,-1--1--1,,1|(838,192)|

1,44,16,41,1,0,0,0,0,64,0,-1--1--1,,1|(985,248)|

1,45,21,42,0,0,0,0,0,64,0,-1--1--1,,1|(847,483)|

1,46,40,42,1,0,0,0,0,64,0,-1--1--1,,1|(977,539)|

1,47,41,17,1,0,0,0,0,64,0,-1--1--1,,1|(1171,278)|

1,48,42,17,1,0,0,0,0,64,0,-1--1--1,,1|(1159,424)|

10,49,Xerox Market Share,307,177,40,20,8,2,1,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,50,Conversion Factor from Months to Dmnl Time,844,691,77,19,8,3,0,0,0,0,0,0

1,51,50,38,1,0,0,0,0,64,0,-1--1--1,,1|(1014,703)|

1,52,36,38,1,0,0,0,0,64,0,-1--1--1,,1|(1074,685)|

10,53,Initial Xerox Retention and Migration Fraction,723,244,40,20,8,2,1,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,54,Initial Xerox Retention and Migration Fraction Ratio,409,114,91,22,8,3,0,0,0,0,0,0

1,55,3,54,1,0,0,0,0,64,1,-1--1--1,,1|(323,164)|

1,56,54,4,1,0,0,0,0,64,1,-1--1--1,,1|(558,135)|

\\---// Sketch information - do not modify anything except names

V300 Do not put anything below this section - it will be ignored

\*Sales Force Time Allotment

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Time per Week Selling,494,35,44,26,3,3,0,0,0,0,0,0

10,2,Time per Week Addressing Customer Admin Issues,494,240,73,33,3,3,0,0,0,0,0,0

10,3,Time per Week on Overhead Activities,496,445,70,26,3,3,0,0,0,0,0,0

12,4,48,202,239,8,8,0,3,0,0,-1,0,0,0

1,5,7,2,4,0,0,22,0,0,0,-1--1--1,,1|(369,238)|

1,6,7,4,100,0,0,22,0,0,0,-1--1--1,,1|(258,238)|

11,7,48,312,238,6,8,34,3,0,0,1,0,0,0

10,8,Net Change in Customer Admin Issues Time per Week,312,268,100,22,40,3,0,0,-1,0,0,0

12,9,48,200,442,8,8,0,3,0,0,-1,0,0,0

1,10,12,3,4,0,0,22,0,0,0,-1--1--1,,1|(374,442)|

1,11,12,9,100,0,0,22,0,0,0,-1--1--1,,1|(259,442)|

11,12,48,317,442,6,8,34,3,0,0,1,0,0,0

10,13,Net Change in Overhead Activities Time per Week,317,469,87,19,40,3,0,0,-1,0,0,0  
 10,14,Total Time per Week Available per Xerox Sales Rep,1195,35,103,25,8,3,0,0,0,0,0  
 10,15,Total Non Selling Time per Week Already Allotted,637,310,62,32,8,3,0,0,0,0,0  
 1,16,2,15,1,0,0,0,0,64,0,-1--1--1,,1|(559,294)|  
 1,17,3,15,1,0,0,0,0,64,0,-1--1--1,,1|(519,375)|  
 10,18,Normal Time per Week Addressing Customer Admin Issues,715,240,77,28,8,3,0,0,0,0,0  
 1,19,18,2,0,0,0,0,64,1,-1--1--1,,1|(609,240)|  
 10,20,Average Schedule Adjustment Time,70,357,58,19,8,3,0,0,0,0,0  
 10,21,Actual Fraction of Time Selling,764,54,66,24,8,3,0,0,0,0,0  
 1,22,14,21,1,0,0,0,0,64,0,-1--1--1,,1|(967,44)|  
 1,23,1,21,1,0,0,0,0,64,0,-1--1--1,,1|(611,43)|  
 10,24,Required Time per Week Addressing Customer Admin  
 Issues,408,174,121,24,8,3,0,0,0,0,0  
 10,25,Required Time per Week on Overhead,537,547,69,21,8,3,0,0,0,0,0  
 1,26,18,24,1,0,0,0,0,64,0,-1--1--1,,1|(589,187)|  
 10,27,Additional Time for Customer Admin Issues due to Customer Admin Center  
 Reorg,366,94,100,33,8,3,0,0,0,0,0  
 10,28,Additional Average Time per Week Required for Industry Focus  
 Training,879,482,88,32,8,3,0,0,0,0,0  
 10,29,Average Time per Week for New Hire Training,1036,546,83,22,8,3,0,0,0,0,0  
 10,30,Hiring New Xerox Sales Reps,629,790,64,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-  
 128-128  
 10,31,Additional Average Time per Week due to FUD Factor,530,638,100,22,8,3,0,0,0,0,0  
 1,32,27,24,1,0,0,0,0,64,0,-1--1--1,,1|(374,136)|  
 1,33,24,8,1,0,0,0,0,64,0,-1--1--1,,1|(396,216)|  
 1,34,2,8,1,0,0,0,0,64,0,-1--1--1,,1|(419,290)|  
 1,35,20,8,1,0,0,0,0,64,0,-1--1--1,,1|(123,300)|  
 1,36,14,1,1,0,0,0,0,64,0,-1--1--1,,1|(826,8)|  
 1,37,15,1,1,0,0,0,0,64,0,-1--1--1,,1|(567,175)|  
 1,38,28,25,1,0,0,0,0,64,0,-1--1--1,,1|(705,514)|  
 1,39,29,25,1,0,0,0,0,64,0,-1--1--1,,1|(786,546)|  
 1,40,31,25,1,0,0,0,0,64,0,-1--1--1,,1|(522,566)|  
 1,41,25,13,1,0,0,0,0,64,0,-1--1--1,,1|(391,520)|  
 1,42,3,13,1,0,0,0,0,64,0,-1--1--1,,1|(433,487)|

1,43,20,13,1,0,0,0,0,64,0,-1--1--1,,1|(109,403)|  
 10,44,Average Travel Time per Week,332,702,62,21,8,3,0,0,0,0,0  
 1,45,44,25,1,0,0,0,0,64,0,-1--1--1,,1|(409,601)|  
 10,46,Fraction of All Xerox Sales Reps Covering Single Industries,119,653,114,24,8,2,0,3,-  
 1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,47,Lookup Table for Average Travel Time per Week as a Function of Fraction of SI  
 Coverage,119,760,114,29,8,3,0,0,0,0,0  
 1,48,47,44,1,0,0,0,0,64,0,-1--1--1,,1|(255,743)|  
 1,49,46,44,1,0,0,0,0,64,0,-1--1--1,,1|(255,661)|  
 10,50,Normal Average Non Travel and Non New Hire Training Overhead Time per  
 Week,140,547,95,33,8,3,0,0,0,0,0  
 1,51,50,25,0,0,0,0,0,64,0,-1--1--1,,1|(344,547)|  
 10,52,Additional Industry Focus Training Time Required for SF  
 Reorg,1001,301,75,33,8,3,0,0,0,0,0  
 10,53,Duration of Sales Force Reorg,1226,279,61,24,8,2,0,3,-1,0,0,0,128-128-128,0-0-  
 0,|12||128-128-128  
 10,54,Average Fraction of Time Required for Industry Focus Training over Duration of SF  
 Reorg,1120,192,117,30,8,3,0,0,0,0,0  
 1,55,53,54,1,0,0,0,0,64,0,-1--1--1,,1|(1220,242)|  
 1,56,52,54,1,0,0,0,0,64,0,-1--1--1,,1|(1012,248)|  
 10,57,Lookup Table for Profile of SF Reorg,1060,491,67,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-  
 0,|12||128-128-128  
 10,58,Fraction of SF Reorg Duration Elapsed since SF Reorg Initiation,1195,339,84,28,8,2,0,3,-  
 1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,59,Actual Fraction of Time Required for Industry Focus Training over Course of SF  
 Reorg,1052,409,111,29,8,3,0,0,0,0,0  
 1,60,54,59,1,0,0,0,0,64,0,-1--1--1,,1|(1113,294)|  
 1,61,57,59,1,0,0,0,0,64,0,-1--1--1,,1|(1091,465)|  
 1,62,58,59,1,0,0,0,0,64,0,-1--1--1,,1|(1184,376)|  
 1,63,59,28,1,0,0,0,0,64,0,-1--1--1,,1|(1009,453)|  
 1,64,14,28,1,0,0,0,0,64,0,-1--1--1,,1|(952,235)|  
 10,65,Time Required for New Hire Training per Rep,1225,744,82,24,8,3,0,0,0,0,0  
 10,66,Number of Xerox Sales Reps in New Hire Training,1001,677,66,36,3,3,0,0,0,0,0  
 12,67,48,802,678,8,8,0,3,0,0,-1,0,0,0  
 1,68,70,66,4,0,0,22,0,0,0,-1--1--1,,1|(903,678)|

1,69,70,67,100,0,0,22,0,0,0,-1--1--1,,1|(834,678)|  
 11,70,48,865,678,6,8,34,3,0,0,1,0,0,0  
 10,71,Going to Training,865,699,60,13,40,3,0,0,-1,0,0,0  
 12,72,48,1241,678,8,8,0,3,0,0,-1,0,0,0  
 1,73,75,72,4,0,0,22,0,0,0,-1--1--1,,1|(1183,678)|  
 1,74,75,66,100,0,0,22,0,0,0,-1--1--1,,1|(1094,678)|  
 11,75,48,1128,678,6,8,34,3,0,0,1,0,0,0  
 10,76,Going to Work,1128,697,48,11,40,3,0,0,-1,0,0,0  
 1,77,30,71,1,0,0,0,0,64,0,-1--1--1,,1|(714,729)|  
 1,78,65,76,1,0,0,0,0,64,0,-1--1--1,,1|(1203,709)|  
 1,79,71,76,1,0,0,0,0,64,0,-1--1--1,,1|(1019,622)|  
 10,80,Initial New Hiring Rate,1134,791,44,22,8,3,0,0,0,0,0,0  
 1,81,30,80,0,0,0,0,0,64,1,-1--1--1,,1|(884,790)|  
 1,82,80,76,1,0,0,0,0,64,1,-1--1--1,,1|(1131,745)|  
 10,83,Actual Number of All Xerox Sales Reps,845,596,73,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,84,Fraction of All Xerox Sales Reps in New Hire Training,1176,596,93,24,8,3,0,0,0,0,0,0  
 1,85,66,84,1,0,0,0,0,64,0,-1--1--1,,1|(1071,611)|  
 1,86,83,84,0,0,0,0,0,64,0,-1--1--1,,1|(993,596)|  
 1,87,14,29,1,0,0,0,0,64,0,-1--1--1,,1|(1293,326)|  
 1,88,84,29,1,0,0,0,0,64,0,-1--1--1,,1|(1150,563)|  
 10,89,Conversion Factor from Reps per Month to Reps,786,762,87,22,8,3,0,0,0,0,0,0  
 10,90,Initial Number of Reps in New Hire Training,983,763,76,22,8,3,0,0,0,0,0,0  
 1,91,89,90,0,0,0,0,0,64,0,-1--1--1,,1|(883,762)|  
 1,92,80,90,1,0,0,0,0,64,0,-1--1--1,,1|(1085,765)|  
 1,93,90,66,1,0,0,0,0,64,1,-1--1--1,,1|(1031,728)|  
 10,94,Internally Perceived State of Xerox,563,711,68,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,95,Lookup Table for Effect of Internally Perceived State of Xerox on Average Time per Week due to FUD Factor,414,775,119,28,8,3,0,0,0,0,0,0  
 1,96,95,31,1,0,0,0,0,64,0,-1--1--1,,1|(445,702)|  
 1,97,94,31,1,0,0,0,0,64,0,-1--1--1,,1|(565,679)|  
 10,98,Initial Time per Week on Overhead Activities,702,442,79,19,8,3,0,0,0,0,0,0

1,99,25,98,1,0,0,0,0,64,0,-1--1--1,,1|(587,485)|  
1,100,98,3,0,0,0,0,64,1,-1--1--1,,1|(601,443)|  
10,101,Lookup Table for Limiting Increases based on Fraction of Time Already  
Allotted,302,359,98,28,8,3,0,0,0,0,0  
10,102,Fraction of Available Time Already Allotted,727,371,79,22,8,3,0,0,0,0,0  
1,103,14,102,1,0,0,0,0,64,0,-1--1--1,,1|(952,164)|  
1,104,15,102,1,0,0,0,0,64,0,-1--1--1,,1|(711,332)|  
1,105,101,8,1,0,0,0,0,64,0,-1--1--1,,1|(338,318)|  
1,106,101,13,1,0,0,0,0,64,0,-1--1--1,,1|(283,415)|  
1,107,102,8,1,0,0,0,0,64,0,-1--1--1,,1|(452,329)|  
1,108,102,13,1,0,0,0,0,64,0,-1--1--1,,1|(500,388)|  
10,109,Time,829,197,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,110,Time Sales Force Reorg is Initiated,897,133,61,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,111,Time Customer Admin Center Reorg is Initiated,978,70,82,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,112,Snapshot of Actual Fraction of Time Selling at Start of First  
Reorg,668,132,90,30,8,3,0,0,0,0,0  
1,113,21,112,1,0,0,0,0,64,0,-1--1--1,,1|(689,64)|  
1,114,109,112,1,0,0,0,0,64,0,-1--1--1,,1|(785,150)|  
1,115,110,112,0,0,0,0,0,64,0,-1--1--1,,1|(803,132)|  
1,116,111,112,1,0,0,0,0,64,0,-1--1--1,,1|(838,111)|  
10,117,Lookup Table for Effect of Ratio of Customers with Detected but Unresolved Billing  
Errors Current vs at Start of CAC Reorg,113,155,110,40,8,3,0,0,0,0,0  
10,118,Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of  
CAC Reorg,134,36,126,31,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
1,119,117,27,1,0,0,0,0,64,0,-1--1--1,,1|(212,108)|  
1,120,118,27,1,0,0,0,0,64,0,-1--1--1,,1|(231,82)|

\\--// Sketch information - do not modify anything except names

V300 Do not put anything below this section - it will be ignored

**\*Product Line Attractiveness**

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Total Attractiveness of Xerox Product Line,614,353,79,24,8,3,0,0,0,0,0

10,2,Time,402,353,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128



10,3,Lookup Table for Total Attractiveness of Xerox Product Line 1 Mild Deterioration,613,512,108,34,8,3,0,0,0,0,0  
1,4,2,1,0,0,0,0,64,0,-1--1--1,,1|(474,353)|  
10,5,Product Line Attractiveness Profile Switch,462,424,96,25,8,3,0,0,0,0,0  
1,6,5,1,1,0,0,0,0,64,0,-1--1--1,,1|(570,408)|  
1,7,3,1,0,0,0,0,64,0,-1--1--1,,1|(613,434)|  
10,8,Lookup Table for Total Attractiveness of Xerox Product Line 2 Significant Deterioration,613,614,108,34,8,3,0,0,0,0,0  
10,9,Conversion Factor from Months to Dmnl Time,462,270,81,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
1,10,9,1,1,0,0,0,0,64,0,-1--1--1,,1|(546,285)|  
1,11,8,1,1,0,0,0,0,64,0,-1--1--1,,1|(730,500)|  
\\---// Sketch information - do not modify anything except names  
V300 Do not put anything below this section - it will be ignored  
\*Satisfaction with Other Factors of Xerox  
\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96  
10,1,Total Satisfaction with Other Factors of Xerox,1219,354,83,24,8,3,0,0,-1,0,0,0  
10,2,Fraction of All CAC Staff Unfamiliar with their Customers,345,28,114,24,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,3,Time,86,84,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,4,Time Customer Admin Center Reorg is Initiated,88,180,82,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
10,5,Snapshot of Fraction of All CAC Staff Unfamiliar with their Customers at Start of CAC Reorg,346,126,115,34,8,3,0,0,0,0,0  
1,6,3,5,1,0,0,0,0,64,0,-1--1--1,,1|(171,88)|  
1,7,4,5,1,0,0,0,0,64,0,-1--1--1,,1|(200,167)|  
1,8,2,5,0,0,0,0,64,0,-1--1--1,,1|(345,65)|  
10,9,Ratio of All CAC Staff Unfamiliar with their Customers Current vs at Start of CAC Reorg,653,76,116,31,8,3,0,0,0,0,0  
1,10,2,9,1,0,0,0,0,64,0,-1--1--1,,1|(515,28)|  
1,11,5,9,1,0,0,0,0,64,0,-1--1--1,,1|(513,128)|  
10,12,Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox,658,174,110,42,8,3,0,0,0,0,0  
10,13,Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Satisfaction with Other Factors of Xerox,960,123,98,44,8,3,0,0,0,0,0

1,14,9,13,1,0,0,0,0,64,0,-1--1--1,,1|(814,56)|  
 1,15,12,13,1,0,0,0,0,64,0,-1--1--1,,1|(824,192)|  
 1,16,13,1,1,0,0,0,0,64,0,-1--1--1,,1|(1164,208)|  
 10,17,Actual Number of All CAC Staff,370,357,69,26,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,18,Snapshot of Actual Number of All CAC Staff at Start of CAC  
 Reorg,371,470,87,34,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,19,Ratio of Actual Number of All CAC Staff Current vs at Start of CAC  
 Reorg,608,404,91,30,8,3,0,0,0,0,0,0  
 1,20,17,19,1,0,0,0,0,64,0,-1--1--1,,1|(481,353)|  
 1,21,18,19,1,0,0,0,0,64,0,-1--1--1,,1|(514,455)|  
 10,22,Fraction of Customers with Undetected Billing Errors,429,599,81,33,3,3,0,0,0,0,0,0  
 10,23,Fraction of Customers with Detected but Unresolved Billing  
 Errors,766,598,82,32,3,3,0,0,0,0,0,0  
 1,24,26,23,4,0,0,22,0,0,0,-1--1--1,,1|(643,598)|  
 1,25,26,22,100,0,0,22,0,0,0,-1--1--1,,1|(550,598)|  
 11,26,812,597,598,6,8,34,3,0,0,1,0,0,0  
 10,27,Detecting Billing Errors,597,629,56,23,40,3,0,0,-1,0,0,0  
 12,28,48,1002,597,8,8,0,3,0,0,-1,0,0,0  
 1,29,31,28,4,0,0,22,0,0,0,-1--1--1,,1|(960,597)|  
 1,30,31,23,100,0,0,22,0,0,0,-1--1--1,,1|(881,597)|  
 11,31,48,921,597,6,8,34,3,0,0,1,0,0,0  
 10,32,Resolving Billing Errors,921,626,59,21,40,3,0,0,-1,0,0,0  
 12,33,48,196,600,8,8,0,3,0,0,-1,0,0,0  
 1,34,36,22,4,0,0,22,0,0,0,-1--1--1,,1|(315,600)|  
 1,35,36,33,100,0,0,22,0,0,0,-1--1--1,,1|(237,600)|  
 11,36,48,276,600,6,8,34,3,0,0,1,0,0,0  
 10,37,Creating Billing Errors,276,630,53,22,40,3,0,0,-1,0,0,0  
 10,38,Average Time for Customers to Detect Billing Errors,445,682,97,24,8,3,0,0,0,0,0,0  
 10,39,Average Time to Resolve Billing Errors,1034,692,59,28,8,3,0,0,0,0,0,0  
 10,40,Normal Average Time to Resolve Billing Errors,1221,691,56,33,8,3,0,0,0,0,0,0  
 10,41,Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing  
 Errors,900,452,114,31,8,3,0,0,0,0,0,0

10,42,Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Average Time to Resolve Billing Errors,614,517,128,32,8,3,0,0,0,0,0

1,43,19,41,1,0,0,0,0,64,0,-1--1--1,,1|(747,405)|

1,44,42,41,1,0,0,0,0,64,0,-1--1--1,,1|(778,495)|

1,45,41,39,1,0,0,0,0,64,0,-1--1--1,,1|(1032,540)|

1,46,40,39,0,0,0,0,0,64,0,-1--1--1,,1|(1136,691)|

1,47,23,32,1,0,0,0,0,64,0,-1--1--1,,1|(846,652)|

1,48,39,32,1,0,0,0,0,64,0,-1--1--1,,1|(943,669)|

1,49,38,27,1,0,0,0,0,64,0,-1--1--1,,1|(560,672)|

1,50,22,27,1,0,0,0,0,64,0,-1--1--1,,1|(529,644)|

10,51,Normal Billing Error Creation Rate,319,734,70,22,8,3,0,0,0,0,0

10,52,Billing Error Creation Rate,148,734,50,23,8,3,0,0,0,0,0

10,53,Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation Rate,149,552,98,34,8,3,0,0,0,0,0

10,54,Lookup Table for Effect of Ratio of Actual Number of All CAC Staff on Billing Error Creation Rate,147,420,92,42,8,3,0,0,0,0,0

1,55,19,53,1,0,0,0,0,64,0,-1--1--1,,1|(276,446)|

1,56,54,53,0,0,0,0,0,64,0,-1--1--1,,1|(147,483)|

1,57,53,52,0,0,0,0,0,64,0,-1--1--1,,1|(148,641)|

1,58,51,52,0,0,0,0,0,64,0,-1--1--1,,1|(230,734)|

1,59,52,37,1,0,0,0,0,64,0,-1--1--1,,1|(229,715)|

10,60,Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors,1060,281,132,35,8,3,0,0,0,0,0

10,61,Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Average Time to Resolve Billing Errors,734,281,149,35,8,3,0,0,0,0,0

1,62,61,60,0,0,0,0,0,64,0,-1--1--1,,1|(898,281)|

1,63,60,39,1,0,0,0,0,64,0,-1--1--1,,1|(1111,474)|

10,64,Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation Rate,122,283,118,34,8,3,0,0,0,0,0

10,65,Lookup Table for Effect of Ratio of All CAC Staff Unfamiliar with their Customers on Billing Error Creation Rate,433,282,138,35,8,3,0,0,0,0,0

1,66,65,64,0,0,0,0,0,64,0,-1--1--1,,1|(274,282)|

1,67,9,64,1,0,0,0,0,64,0,-1--1--1,,1|(428,195)|

1,68,64,52,1,0,0,0,0,64,0,-1--1--1,,1|(27,518)|

10,69,Snapshot of Fraction of Customers with Detected but Unresolved Billing Errors at Start of CAC Reorg,713,762,122,31,8,3,0,0,0,0,0

10,70,Ratio of Customers with Detected but Unresolved Billing Errors Current vs at Start of CAC Reorg,1018,762,116,31,8,3,0,0,0,0,0

1,71,23,70,1,0,0,0,0,64,0,-1--1--1,,1|(812,679)|

1,72,69,70,0,0,0,0,64,0,-1--1--1,,1|(861,762)|

10,73,Lookup Table for Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox,923,366,132,35,8,3,0,0,0,0,0

10,74,Effect of Ratio of Unresolved Billing Errors on Satisfaction with Other Factors of Xerox,1219,501,85,46,8,3,0,0,0,0,0

10,75,Time,466,727,26,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,76,Time Customer Admin Center Reorg is Initiated,470,792,82,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,77,75,69,1,0,0,0,0,64,0,-1--1--1,,1|(540,726)|

1,78,76,69,1,0,0,0,0,64,0,-1--1--1,,1|(569,787)|

1,79,23,69,1,0,0,0,0,64,0,-1--1--1,,1|(720,670)|

1,80,9,60,1,0,0,0,0,64,0,-1--1--1,,1|(845,173)|

1,81,70,74,1,0,0,0,0,64,0,-1--1--1,,1|(1164,654)|

1,82,73,74,1,0,0,0,0,64,0,-1--1--1,,1|(1094,408)|

1,83,74,1,0,0,0,0,64,0,-1--1--1,,1|(1219,423)|

\\---// Sketch information - do not modify anything except names

V300 Do not put anything below this section - it will be ignored

\*Customer Administration Center Reorg

\$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96

10,1,Time Customer Admin Center Reorg is Initiated,264,116,86,22,8,3,0,0,0,0,0

10,2,Time,264,41,33,11,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

10,3,Duration of Customer Admin Center Reorg,266,188,75,25,8,3,0,0,0,0,0

10,4,CAC Staff Unfamiliar with their Customers,403,598,60,31,3,3,0,0,0,0,0

10,5,CAC Staff Familiar with their Customers,773,600,54,32,3,3,0,0,0,0,0

1,6,8,5,4,0,0,22,0,0,0,-1--1--1,,1|(657,598)|

1,7,8,4,100,0,0,22,0,0,0,-1--1--1,,1|(523,598)|

11,8,1180,589,598,6,8,34,3,0,0,1,0,0,0

10,9,Gaining Familiarity with Customers for CAC Staff,589,625,82,19,40,3,0,0,-1,0,0,0

1,10,12,4,4,0,0,22,0,0,0,-1--1--1,,3|(403,733)|(403,733)|(403,681)|

1,11,12,5,100,0,0,22,0,0,0,-1--1--1,,3|(772,733)|(772,734)|(772,683)|  
 11,12,1404,597,733,6,8,34,3,0,0,1,0,0,0  
 10,13,Reassignments of CAC Staff,597,764,62,23,40,3,0,0,-1,0,0,0  
 10,14,Average Time to Gain Familiarity for CAC Staff,494,702,80,19,8,3,0,0,0,0,0,0  
 1,15,4,9,1,0,0,0,0,64,0,-1--1--1,,1|(484,620)|  
 1,16,14,9,1,0,0,0,0,64,0,-1--1--1,,1|(590,670)|  
 12,17,48,151,618,8,8,0,3,0,0,-1,0,0,0  
 1,18,20,4,4,0,0,22,0,0,0,-1--1--1,,1|(295,618)|  
 1,19,20,17,100,0,0,22,0,0,0,-1--1--1,,1|(197,618)|  
 11,20,48,242,618,6,8,34,3,0,0,1,0,0,0  
 10,21,Normal Hiring of New CAC Staff,242,649,60,23,40,3,0,0,-1,0,0,0  
 12,22,48,406,417,8,8,0,3,0,0,-1,0,0,0  
 1,23,25,22,4,0,0,22,0,0,0,-1--1--1,,1|(406,447)|  
 1,24,25,4,100,0,0,22,0,0,0,-1--1--1,,1|(406,524)|  
 11,25,48,406,476,8,6,33,3,0,0,2,0,0,0  
 10,26,CAC Staff Leaving Xerox via Normal Attrition Path A,332,476,66,32,40,3,0,0,-1,0,0,0  
 12,27,48,987,621,8,8,0,3,0,0,-1,0,0,0  
 1,28,30,27,4,0,0,22,0,0,0,-1--1--1,,1|(941,621)|  
 1,29,30,5,100,0,0,22,0,0,0,-1--1--1,,1|(859,621)|  
 11,30,48,897,621,6,8,34,3,0,0,1,0,0,0  
 10,31,CAC Staff Leaving Xerox via Normal Attrition Path B,897,665,65,36,40,3,0,0,-1,0,0,0  
 10,32,Fraction of CAC Reorg Duration Elapsed since CAC Reorg  
 Initiation,509,117,86,32,8,3,0,0,0,0,0,0  
 1,33,1,32,0,0,0,0,0,64,0,-1--1--1,,1|(379,116)|  
 1,34,2,32,1,0,0,0,0,64,0,-1--1--1,,1|(413,66)|  
 1,35,3,32,1,0,0,0,0,64,0,-1--1--1,,1|(440,159)|  
 10,36,CAC Staff Fractional Reassignment Rate before and after CAC  
 Reorg,1213,514,90,33,8,3,0,0,0,0,0,0  
 1,37,5,13,1,0,0,0,0,64,0,-1--1--1,,1|(719,706)|  
 10,38,Target Fraction of All CAC Positions to Eliminate over Duration of CAC  
 Reorg,1199,44,94,30,8,3,0,0,0,0,0,0  
 10,39,Actual Number of All CAC Staff,598,556,58,22,8,3,0,0,0,0,0,0  
 1,40,4,39,1,0,0,0,0,64,0,-1--1--1,,1|(484,561)|

1,41,5,39,1,0,0,0,0,64,0,-1--1--1,,1|(693,562)|  
 10,42,Lookup Table for Profile of CAC Reorg,182,360,51,34,8,3,0,0,0,0,0  
 10,43,CAC Reorg Phase,54,116,46,20,8,3,0,0,0,0,0  
 1,44,1,43,0,0,0,0,0,64,0,-1--1--1,,1|(146,116)|  
 1,45,2,43,1,0,0,0,0,64,0,-1--1--1,,1|(143,66)|  
 1,46,3,43,1,0,0,0,0,64,0,-1--1--1,,1|(124,155)|  
 10,47,Average Time Required to Find and Hire and Train New CAC  
 Staff,85,706,81,33,8,3,0,0,0,0,0  
 1,48,47,21,1,0,0,0,0,64,0,-1--1--1,,1|(194,694)|  
 10,49,Fraction of All CAC Staff Unfamiliar with their Customers,715,472,73,31,8,3,0,0,0,0,0  
 1,50,4,49,1,0,0,0,0,64,0,-1--1--1,,1|(534,522)|  
 1,51,39,49,0,0,0,0,0,64,0,-1--1--1,,1|(643,522)|  
 12,52,48,152,577,8,8,0,3,0,0,-1,0,0,0  
 1,53,55,4,4,0,0,22,0,0,0,-1--1--1,,1|(295,576)|  
 1,54,55,52,100,0,0,22,0,0,0,-1--1--1,,1|(198,576)|  
 11,55,48,242,576,6,8,34,3,0,0,3,0,0,0  
 10,56,Anticipatory Hiring of New CAC Staff,242,548,76,20,40,3,0,0,-1,0,0,0  
 10,57,Snapshot of Actual Number of All CAC Staff at Start of CAC  
 Reorg,619,42,88,34,8,3,0,0,0,0,0  
 10,58,Actual Number of All CAC Staff,732,118,62,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,12||128-128-128  
 1,59,2,57,1,0,0,0,0,64,0,-1--1--1,,1|(407,41)|  
 1,60,1,57,1,0,0,0,0,64,0,-1--1--1,,1|(421,71)|  
 1,61,58,57,1,0,0,0,0,64,0,-1--1--1,,1|(645,102)|  
 10,62,Desired Number of All CAC Staff before CAC Reorg,701,264,70,32,8,3,0,0,0,0,0  
 10,63,Normal Fractional CAC Attrition Rate,429,387,69,21,8,3,0,0,0,0,0  
 10,64,Normal Fractional CAC Attrition Rate,859,756,67,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,12||128-128-128  
 1,65,4,26,1,0,0,0,0,64,0,-1--1--1,,1|(357,531)|  
 1,66,63,26,1,0,0,0,0,64,0,-1--1--1,,1|(351,409)|  
 1,67,64,31,1,0,0,0,0,64,0,-1--1--1,,1|(897,722)|  
 1,68,5,31,1,0,0,0,0,64,0,-1--1--1,,1|(803,649)|  
 10,69,Target Number of All CAC Positions to Eliminate over Duration of CAC  
 Reorg,928,46,95,29,8,3,0,0,0,0,0

1,70,57,69,0,0,0,0,0,64,0,-1--1--1,,1|(763,43)|  
 1,71,38,69,0,0,0,0,0,64,0,-1--1--1,,1|(1070,44)|  
 10,72,Absolute CAC Staff Leaving Rate during CAC Reorg,849,360,101,24,8,3,0,0,0,0,0  
 1,73,42,72,1,0,0,0,0,64,0,-1--1--1,,1|(483,360)|  
 1,74,32,72,1,0,0,0,0,64,0,-1--1--1,,1|(721,186)|  
 1,75,3,72,1,0,0,0,0,64,0,-1--1--1,,1|(547,271)|  
 12,76,48,439,418,8,8,0,3,0,0,-1,0,0,0  
 1,77,79,76,4,0,0,22,0,0,0,-1--1--1,,1|(439,447)|  
 1,78,79,4,100,0,0,22,0,0,0,-1--1--1,,1|(439,524)|  
 11,79,48,439,475,8,6,33,3,0,0,4,0,0,0  
 10,80,CAC Staff Leaving Xerox due to CAC Reorg Path A,516,475,69,29,40,3,0,0,-1,0,0,0  
 12,81,48,988,581,8,8,0,3,0,0,-1,0,0,0  
 1,82,84,81,4,0,0,22,0,0,0,-1--1--1,,1|(940,580)|  
 1,83,84,5,100,0,0,22,0,0,0,-1--1--1,,1|(858,580)|  
 11,84,48,895,580,6,8,34,3,0,0,3,0,0,0  
 10,85,CAC Staff Leaving Xerox due to CAC Reorg Path B,895,538,61,34,40,3,0,0,-1,0,0,0  
 1,86,49,80,0,0,0,0,0,64,0,-1--1--1,,1|(620,473)|  
 1,87,49,85,1,0,0,0,0,64,0,-1--1--1,,1|(777,524)|  
 1,88,72,80,1,0,0,0,0,64,0,-1--1--1,,1|(672,386)|  
 1,89,72,85,1,0,0,0,0,64,0,-1--1--1,,1|(887,422)|  
 10,90,CAC Reorg Phase,785,410,44,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 1,91,90,80,1,0,0,0,0,64,0,-1--1--1,,1|(660,428)|  
 1,92,90,85,1,0,0,0,0,64,0,-1--1--1,,1|(853,452)|  
 10,93,Current Desired Number of All CAC Staff,586,203,84,26,8,3,0,0,0,0,0,0  
 1,94,69,93,1,0,0,0,0,64,0,-1--1--1,,1|(775,143)|  
 1,95,62,93,1,0,0,0,0,64,0,-1--1--1,,1|(604,251)|  
 1,96,32,93,0,0,0,0,0,64,0,-1--1--1,,1|(544,157)|  
 10,97,Current Desired Number of All CAC Staff,227,780,88,25,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 10,98,Actual Number of All CAC Staff,397,778,62,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128  
 1,99,97,21,1,0,0,0,0,64,0,-1--1--1,,1|(222,709)|  
 1,100,98,21,1,0,0,0,0,64,0,-1--1--1,,1|(290,732)|

1,101,43,93,1,0,0,0,0,64,0,-1--1--1,,1|(213,220)|

10,102,Total Number of CAC Staff Leaving Xerox over Duration of CAC  
Reorg,861,185,99,30,8,3,0,0,0,0,0

1,103,69,102,1,0,0,0,0,64,0,-1--1--1,,1|(919,117)|

1,104,102,72,1,0,0,0,0,64,0,-1--1--1,,1|(836,248)|

10,105,Actual Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC  
Reorg,1143,295,132,38,8,3,0,0,0,0,0

10,106,Actual Additional Number of All CAC Staff Leaving Xerox over Duration of CAC  
Reorg,1144,185,131,34,8,3,0,0,0,0,0

1,107,105,106,1,0,0,0,0,64,0,-1--1--1,,1|(1101,240)|

1,108,57,106,1,0,0,0,0,64,0,-1--1--1,,1|(893,89)|

1,109,106,102,0,0,0,0,0,64,0,-1--1--1,,1|(993,185)|

10,110,Ratio of CAC Staff Fractional Reassignment Rate during CAC Reorg to that Not during  
CAC Reorg,1207,653,94,44,8,3,0,0,0,0,0

10,111,Actual CAC Staff Fractional Reassignment Rate,1073,783,95,22,8,3,0,0,0,0,0

1,112,36,111,1,0,0,0,0,64,0,-1--1--1,,1|(1088,636)|

1,113,110,111,1,0,0,0,0,64,0,-1--1--1,,1|(1170,736)|

1,114,111,13,1,0,0,0,0,64,0,-1--1--1,,1|(817,799)|

10,115,CAC Reorg Phase,1259,783,44,19,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,116,115,111,1,0,0,0,0,64,0,-1--1--1,,1|(1198,783)|

10,117,Anticipated Additional Fraction of All CAC Staff Leaving Xerox over Duration of CAC  
Reorg since they Do Not Relocate,112,261,88,55,8,3,0,0,0,0,0

10,118,Snapshot of Actual Number of All CAC Staff at Start of CAC  
Reorg,61,604,54,51,8,2,0,3,-1,0,0,0,128-128-128,0-0-0,|12||128-128-128

1,119,42,56,0,0,0,0,0,64,0,-1--1--1,,1|(211,454)|

1,120,3,56,1,0,0,0,0,64,0,-1--1--1,,1|(254,363)|

1,121,32,56,1,0,0,0,0,64,0,-1--1--1,,1|(325,319)|

1,122,43,56,1,0,0,0,0,64,0,-1--1--1,,1|(23,345)|

1,123,118,56,1,0,0,0,0,64,0,-1--1--1,,1|(131,546)|

1,124,117,56,1,0,0,0,0,64,0,-1--1--1,,1|(110,395)|